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THE BOTANIC GARDENS OF CEYLON.

FROM Dr. Trimen's interesting Report, of which we give the main portions as a special Supplement with this issue of the *Tropical Agriculturist*, we gather, that during 1890 quite a number of plants, which are enumerated, flowered for the first time in the Peradeniya Gardens. Amongst these was that wonder of the vegetable world, the Coco-de-mer palm, to which the eccentric speculations of General Gordon have added a new interest. The abstraction of the flower is discreditable and vexatious. Some readers may need to be reminded that the seed of this palm takes no less than *ten years* to ripen! A specimen of the most imperial of all the palm tribe, the talipot, is, visitors will be glad to learn, in full blossom in the Gardens at Peradeniya. The rainfall at this place, 1,600 feet above the level of Colombo and on the banks of our greatest river, was 82·18 inches, or about 2½ inches under the average, that average itself being lower by 2½ inches than that of the Colombo rainfall. The visitors to Peradeniya (mostly strangers) numbered 1,454. A new and enlarged edition, the 3rd, of the interesting Handbook has been prepared. Large space is devoted to the beautiful mountain gardens at Hakgala, for which Mr. Nock has done so much during the nine years of his incumbency. A bed of the comparatively rare and striking red balsam, *Impatiens Walkerii*, has been added to the attractions of the Gardens, and the grand fernery has been entirely remodelled and greatly improved. With reference to the complaint that there is no demand for 3,000 plants of English oak which are available, and that the Botanical Department has not sufficient means to plant them out, surely this is a work which the Forest Department ought specially to undertake. Planted pretty closely, the trees might be thinned out and their quality as fuel tested. An Assam oak, *Quercus serrata*, has been found by Mr. Gammie of the Darjiling Cinchona Plantations to yield a superior fuel when quite young, and this species will be tried in Ceylon, as we had received notice of the posting to our address of 6 lb. of the acorns, just before we sat down to pen this notice. An Indian oak having given such results, the English oak is surely worthy of a trial. It is here, of course, of quicker growth than in its native habitat. When are we to see the Forest Department utilizing on a large scale, for arboreal experiments, the vast tracts of patana land stretching in all directions from Hakgala and Nuwara Eliya?

As we noticed at the time, May 1890 was remarkable at Hakgala for a wealth of floral beauty. On one day 610 distinct species and varieties were in flower, including 60 distinct varieties of roses of which some had hundreds of flowers. Tourist visitors have greatly increased, the names for 1890 numbering 1,319. Elk, porcupines and hares have waged annoying warfare against some of Mr. Nock's plants, and sportsmen ought to wage war against these specimens of our fauna in turn. The monsoon weather of the year was abnormally light in wind and rain, with more thunder, however, than had been observed for 9 years. The air temperature went down to 40° on 23rd December, the thermometer on the grass marking 37°. Sharp frosts occurred at Sita Eliya, close by. The maximum temperature of the air was 78·2 on May 12th. The mean temperature ranged from 58·6 in December, to 66·2 in May. The rainfall for the year was only 70·97 inches, less by 16·55 inches than the average. Interesting details are given regarding the Tropical Gardens at Henaratgoda, with a climate hotter by nearly 20° than that of Hakgala, and in connection with the dying of plants in the Anuradhapura Garden, we get a vivid idea of the series of "terribly" dry years, which have nearly evaporated Kalawewa to dryness and left the tanks at Anuradhapura to suffer in sympathy. The Badulla Garden is fast becoming attractive, the one drawback being the ravages, especially in nurseries, of the termites—the "white ants" of non-scientific parlance. Interchanges of plants and seeds have been on a diminished scale, and Dr. Trimen expresses anxiety to see private nurserymen relieve his department of the task of making up wardian cases of plants. The wonderful progress of tea is contrasted with the decadence of coffee, of which only 86,000 cwt. were shipped from Ceylon in 1890. Twenty years previously the culminating export of over one million of cwt. was reached and simultaneously the fatal fungus began its deadly work. Much interesting information is given regarding cacao, and Dr. Trimen complains of the absence of visible results from

the large number of seed pods disseminated by his department for the use of the natives. Sanguine expectations are entertained of the success of the Pará rubber tree, if grown by the Forest Department on a large scale. As a result of Dr. Trimen's visit to Java, we may expect the medicinal pepper known as "cubebs" to be added to our economical products, together with other useful plants. Nutmegs are noticed as likely to be profitably grown in the lowcountry. Our own experiments have proved that they are not happy in the ordinary conditions which suit tea and coconuts. They evidently require deep soil or very careful culture. From the information given, New Zealand flax would seem to be *the* fibre plant to which attention ought to be directed by planters. An experiment by Mr. Nock on a plant grown under favourable conditions showed that an acre of similar plants would yield 54 tons of leaves. Say that 40 tons were the average and that the result in clean fibre was 10 tons, it looks as if this ought to pay? There is a plant of *Phormium tenax* in flower and seed on Abbotsford, just now, and the resemblance to "Indian shot" is striking. The plant grows luxuriantly at high altitudes; and by mere separation of the leaves, good fibre string is obtained. We should like to see an experiment made with the long tough leaves of the "hot poker" (*Tritoma revaria*). The details of the partially successful attempt to grow apples at Hakgala and the most encouraging trials of potatoes are interesting and ought to be useful. The successful growth of "blackberries" (such a favourite fruit in the United States) from English seed is also interesting, and planters ought to have some of these plants in their gardens for dessert and tart fruits. We are glad to see that Dr. Trimen has been adding to the Flora of Ceylon, and that materials are being got ready for the long-promised Botanical Handbook. When it does appear, we trust it may contain or be accompanied by coloured portraits of some of our most characteristic, beautiful and peculiar plants,—such as the doons, kumbuks, balsams and nilus. The Museum is extending, and the Laboratory is occupied by a fresh student from England. The sales of plants and seeds, which have been decreasing, realized R2,280, while the total cost of the establishments has been R41,535. The money is well spent, and the colony is repaid by the presence and advice of so eminent a scientific expert as the Director; while the Gardens, besides affording means of humanizing recreation to the local inhabitants, add largely to the attractions of scenery and of tropical and subtropical vegetation which the island offers to visitors from Europe, America, Australia, India and other countries.

RAKWANA GEMMING OPERATIONS—SALE OF GEMS.—Jan. 14th:—Mr. Justice Dias has been on a visit to his estates, and will see the new factory for them which has been erected since his last visit and fitted up with machinery with the best and latest improvement. Mr. Baddeley proceeded to Colombo a few days ago with a quantity of gems. Fine sapphires are still found on Rangwallatenne estate. Mr. F. L. Shand also went to Colombo with Mr. Baddeley. The natives are pushing on with gemming, but are not doing much. The plumbago pit on Barra estate is being worked vigorously, and a large quantity of plumbago was despatched to Colombo on the 10th inst. Illicit gemming is still going on on Handopanu and the Crown lands. Mr. John Brown of the Commercial Company paid a visit the other day to Hatherleigh estate. On Wednesday last there was a sale of gems on Bottiatenne. The stones were not very valuable and there were only three lots. The first lot fetched R235; the second lot R80; and the third lot R60. Most of the gems sold were sapphires.—Local "Times."

THE ARCHÆOLOGICAL SURVEYOR, MADRAS, during a recent visit to Ramesvaram gained some interesting information on the ceremonies performed by pilgrims while on their journey to and at that shrine. He inspected the sacred bathing place of Dhanishkodi, at present situated at the end of a long strip of sand about 15 miles south-east from Ramesvaram. It is considered sacred as being the meeting place of the waters of the two seas—Mahothathi (north) and Rathnakaram (south). There are no ancient buildings at the present bathing place; and on inquiry he learned that the sea is receding at this point and the land has advanced at the rate of about 5 miles in the last 40 years. A narrow strip of shallow water separates Dhanishkodi from an island about 15 miles long, and when this strip silts up, as it is steadily doing, the pilgrims will have to travel other 15 miles to the meeting of the waters.—*Madras Mail*, Dec. 5th.

SIR CHARLES BRUCE, K. C. M. G., writes in the current number of the *English Illustrated Magazine* on British Guiana—its history, its present condition and its prospects. After briefly referring to the discovery of Guiana by Sir Walter Raleigh and the subsequent visits to the country of other enterprising spirits of the Elizabethan era, Sir Charles proceeds to recount its cessions and retrocessions and conquests, its boundaries, and the physical features of the Colony as it is at the present day. The legislative machinery is also briefly described, together with the people, the fauna, and the religious and educational systems. Sir Charles commends the absence of prejudice against the coloured inhabitants of the Colony, and remarks that the African race is rapidly coming forward in the management of plantations and other commercial enterprise. He thinks that great credit is due to the Dutch for the admirable scientific and technical skill with which they planned and accomplished the settlement of Guiana, and describes the methods of the Hollanders at some length. In the opinion of Sir Charles, the prosperity of British Guiana is the offspring of sugar, and it is only the enterprises and monetary resources of the planters that have saved the Colony from the depression of the sugar industry which has seriously affected the West Indian islands. Among those who have been chiefly instrumental in enabling British Guiana to struggle against the menacing increase in the beet crop, "a prominent place will be universally conceded to Mr. Quinton Hogg, who has spared neither money nor his own intelligent energy in introducing and perfecting the new process by which sugar is extracted from the cane by diffusion." Sir Charles adds that the Government are making persistent and strenuous efforts to develop the vast dormant resources of the Colony, and the low rate at which land can be brought is certainly calculated to encourage the agricultural industry. The discovery of gold gave British Guiana hopes as to its mineral wealth, and mining for the metal is now pursued to some extent, while some regions have but recently been proved diamondiferous. "At a time when much British capital is seeking investment in the sphere of British influence in South Africa, and elsewhere altogether outside the sphere of British influence, it may be admitted to be the duty of all concerned in the administration of the outlying provinces of our own Empire to invite attention to fields for the investment of capital within its limits." The Colony at present is too deficient in labour and capital to take advantage of its unquestionable natural wealth, and a more venal motive, as well as patriotism, should lead British investors to turn their millions into West Indian channels instead of persistently ignoring them for foreign republics.—*Colonies and India*, Feb. 7th.

CEYLON UPCOUNTRY PLANTING REPORT.

P. A. MEETING—LENGTHY REPORT—SUGGESTION—CUBEBS—P. A. SECRETARYSHIP—WEATHER—TEA—DRUNKEN COOLIES AND DRUNKEN PLANTERS—AN INDIAN STAFF-SURGEON ON MALARIA—DRINKING GOOD WATER AS A MEANS OF PRVENTING SUNSTROKE.

Feb. 22nd.

The annual meeting of the Planters' Association is becoming every year more and more dreadful owing to the length of the report. *Forty-five* minutes occupied in reading it, to an audience some of whom were talking, some few listening, many yawning, and all more or less bored*, one would think it is hard enough on the Secretary to compile this voluminous record; but to have to read it after it has been got up, seems cruelty. If it be an essential that the report be read it would be a wise thing, I think, to make it the *last* part of the programme; and then, those who really care to hear the record of the year's doings gabbled over can indulge themselves to their hearts' content. As it is at present, much valuable time is wasted, which might well be spent on other and more important matters. The report is no doubt a very praiseworthy production, and the sweep of the net is so extensive that anything that but touches the planter's interest is lauded, and made a prize of. But when you think of the many legitimate topics which rightly call for attention and comment, and that after all life is short, all zeal ought to be repressed. This may be hard on the Secretary; and if he feels aggrieved at not having his full swing, I for my part would willingly vote that Mr. Philip should have more pay, rather than that we should have more report.

As an evidence of this growing evil of over-reporting and the dangers into which it leads, take this passage under the heading of minor products:—

"Cubebs.—The true plant yielding this valuable berry has still to be introduced into Ceylon, all previous introductions having turned out factitious." Without staying to notice this funny use of the word "factitious." I would ask was there ever a finer specimen of the evil I complain of than what I quote? It matches the historic chapter on the snakes in Iceland. There were no snakes in Iceland; and there are no "cubebs" in Ceylon!

If this sort of thing goes on where are we going to end? for the principle which would allow a paragraph on "cubebs," would in the hands of a willing and voluminous scribe like Mr. Philip allow almost anything. To be sure if the report were simply printed, and one could read it or not just as one liked, it would not matter much; but as things obtain at present, if you attend the annual meeting you must hear the report, and what a tiresome time-destroying thing, that is, we all know.

It is hard to imagine the Planters' Association with any other Secretary than Mr. Philip: but of course a time will come—may it be long distant—when the position will have to be filled by some one else. When the necessity arises to appoint a new Secretary, where will the man be found bold enough to undertake the duties? If these yearly reports go on increasing in volume as they do, the very thought of them would choke off all except the rashest.

It is all very well for a man who likes it, to go on using up stationery by the ream, and filling innumerable pages of foolscap with "copy": but is posterity to be wholly ignored? Lord Brougham felt that Campbell's "Lives of the Chancellors" added a fresh sting to death: but these bloated and overgrown reports are death itself: for the post of Secretary will assuredly become extinct, when the present incumbent takes off his mantle and lays down his pen. It is with a view to prevent such an appalling catastrophe, and before things are beyond all hope, that I draw attention to the danger ahead.

The weather has all of a sudden changed, and without any warning we have been dropped as it were into the hot season. I suppose we may get used to it, but meanwhile, the sun is broiling, and the days are hot.

Tea is simply doing wonders, and there has been little or no complaint of the difficulty of finding work for coolies, as often happens at this season. To get round the flush in time is what bothers.

To see ourselves as others see us, is often a revelation. An appu the other day informed his master that the coolies were all drunk in the lines. "Drunk?" queried the planter. "How do you know they are drunk?" "I know they are drunk, you can hear the noise," was the answer. "But there might be noise without the coolies being drunk," continued the planter. "Sir," replied the appu, "when master gets drunk he keeps quiet, but when a cooly gets drunk he makes a noise, becomes quarrelsome and wants to fight."

I remember in the old days, when Colombo Fort was really a fort, hearing of two upcountry men, returning from a convivial evening being challenged by the sentry. "Who goes there?' shouted the guard, and the reply came back "Just twa drucken planters!"

It would seem, in spite of all temperance teaching, that those old worthies—rather *un*worthies—are not without their representatives today. More is the pity.

A retired Indian Staff-Surgeon was writing last month in the *Lancet* on "Malaria," and giving general advice on the best means for the Anglo-Indian to preserve his health. Now that the hot weather is on us, it may not be out of the way to quote the following:—"Good drinking water plays an important *role* in the preservation of health, for the incessant drain of fluid from the system by perspiration requires a liberal supply of water, and though the result is prickly heat, the benefit to health is ample compensation. A long drink of cool—not iced—water before and after exposure to the sun is an almost certain protection against sunstroke, *provided the water is not diluted with a little spirit.*" I have taken the liberty to italicize where it seems to me that the point comes in.

PEPPERCORN.

* Has our correspondent heard how the Yankee puts it: Speeches (or for that matter Reports) should not exceed (so many) minutes; for if "ile" is not struck in that time, the speaker or Secretary should give up *boring!*—In respect of the ponderous P. A. Report, we certainly think that after it is gone over in Committee, it should do if the *headings* were read at the General Meeting, and then if any member wishes what is said under any one head, read out in detail, this could be done.—ED. *T. A.*

MINES AND MINING IN CEYLON.

We have frequently had our attention called to the unsystematic mode of plumbago mining in Ceylon, and to the necessity for government interference, more particularly with the view of protecting the health and lives of miners, and secondarily with the view to establishing a systematic mode for the working of mines: we shall begin by describing the common modes adopted by the Cinhalese.

A native usually drives a shaft as far as he can, so long as he is able to contend with the flow of water in the mine. He then stops working, and afterwards drives galleries, and this he continues to do as long

as his lamps will burn, but the moment the lamp are extinguished by the gases collected in the gallery he ceases working in that part and continues upwards refilling the shaft he has dug with the *débris* from the mine. In other cases, instead of sinking a shaft a large open cutting is made, in which they follow the vein and afterwards run galleries as occasion may require.

They have no system for ventilating their mines, and the result is that after a blast much time has frequently to be wasted before the mine is sufficiently cleared of foul gases to allow working to be resumed.

Then as regards the timbering of mines. The great object of the native proprietor is to keep his expenses as low as possible. As to the timber he is using he knows nothing of its strength, and is quite unable to work out the strain it will stand. He doubtless knows certain timber will resist damp, and is stronger and tougher than other woods, and when procurable would probably use such woods in preference, but as the wood is generally green and full of sap it necessarily cannot resist the ravages of damp as it would do if it were properly seasoned. The result of all this is that the shafts and galleries are frequently insufficiently timbered.

The windlass used is frequently insufficiently strong, and has no rachet-wheel or pawl, so that serious accidents may occur in raising and lowering miners. The rope used is the ordinary coir rope of the country, the strength of which doubtless varies very much though of the thickness, according to where it has been made and the quality of the fibre used.

Instead of the rope a ladder is frequently used by the miners, and these are made of the roughest materials and frequently tied with jungle rope or ordinary coir yarn. There is no regulated distance between the rungs of the ladder, as at home, there the ladders are fixed at some convenient angle with substantial platforms of not more than twenty yards apart. In Ceylon there is a perpendicular ladder to the bottom of the pit, and when it is remembered how highly lubricated the wood must get from the hands and feet of the natives who have been working plumbago, the great danger they run every time they mount and descend can be well conceived.

There is no inspection of the mines, and last year a very serious accident occurred in one of the Rakwana gem pits, leading to death by drowning.

The Government has enacted an ordinance by which they reserve to themselves the right of control over the safety of the miners, but as yet we have heard of no steps being taken to formulate rules and regulations for the management of the mines such as are in use in England.

Of course it is not sufficient for the Government to make rules and regulations without seeing they are carried out, and for this it would be necessary to appoint an inspector of mines whose orders the native headmen should see carried out. A very necessary regulation is an up-cast and down-cast shaft, or in the case of small mines at least of an adit, otherwise in case of an accident in the main shaft the miners may all be buried.

As an example of the want of feeling amongst the natives, we instance the case of a man who was buried in a gallery through the falling of a large mass of earth. His companions, taking for granted he would be dead, were simply going to leave him there, but fortunately for him, a family connection of his insisted on his being dug out—alive.

Probably the Government might fear, when first introducing any new laws and regulations, they might seriously affect the plumbago industry, and consequently the revenue obtained therefrom. This perhaps, might be sufficient to cause delay in introducing them.

The fear that may be entertained as regards any interference with the trade and revenue in plumbago can only be very short-lived, as the new regulations will only weed out of those proprietary miners who have small capital and are unable to do justice to the men they employ; but it will have the good effect of inducing a systematic class of mining which can only bear good fruit. For, from what we have always heard, that the further down the mines are carried, the larger the plumbago veins and better the quality, so that were our mines worked to anything like the depth of some English mines, we feel convinced that the plumbago would not only be found in larger quantities, but the quality would be better.

We learn from a geological friend that it is his opinion that our metamorphic rocks when they were in a sedimentary form previous to the igneous action which crystalized them, carried a large amount of coal or carboniferous matter, perhaps in the form of lignite, and that the igneous action which crystalized these rocks which must have been under great pressure, converted the carboniferous matter into graphite, and to the same igneous action must be attributed the upheaval of our rocks, and to this must also be attributed the more or less vertical position of many of our graphite veins.

Should our friend be right in his surmises, it will be easy to conceive what large deposits of graphite we may find when mining is conducted more systematically and at greater depths.

There is still another matter we consider deserving attention, and that is the large number of minerals dug out of plumbago mines, and which doubtless have some value, but with which the natives have no acquaintance, and consequently these are sometimes thrown away. We instance amongst other minerals pitchblende, so well known as a valuable ore of uranium and which has been found inside plumbago. The *Daily Telegraph* last year had an article on the subject of uranium, and amongst other matters noted the market price is quoted at about £2,400 a ton.

Then there is the mineral pyrrhotite, which is found largely in plumbago mines, and from which in other countries the greater part of the nickel of commerce is extracted. However, we are unable to state with certainty if the pyrrhotite discovered in Ceylon is nickeliferous, but think in all probability it will be found so. Steatite is, we believe, a common product of plumbago mines. Magnetite, showing strong polarity, is also common in many parts of the island. Chalcopyrite, a mineral that has been found in various parts of the island is one that doubtless can be worked to advantage. These minerals containing such rare elements are columbian yttrium and zirconium, are found in our alluvial deposits, and would probably be found in the matrix were there sufficient demand for them. Mica sometimes in large plates is abundant. Gold has been found in numberless places and in large nuggets in the neighbourhood of Morawaka. Manganese is abundant, and of course Ceylon is specially noted as a gem-producing country, but on this subject we intend writing more later on, and, doubtless, there are numberless other minerals which have escaped notice, and we feel sure that the day is not far off when Ceylon will prove itself much richer in useful minerals than it has had credit for.

The fact that so little is known of the mineralogy of Ceylon is in a great measure due to the want of interest taken in it by Government, whose system has been so far with one exceptional case to leave all such matters to private enterprise.

To those who are acquainted with the Government and history of Ceylon it must strike them as very anomalous that so many new laws and regulations should be constantly enacted by Government in reference to the health and well-being of our imported labourers from India (a class who are more specially well looked after by their masters, and who would have the same care devoted to them irrespective of any Government ordinances), when this same Government neglects the health and welfare of a large proportion of the aborigines, whose lives, we think, should be equally valued with those of their brethren of India.

Should death occur in mining through carelessness on the part of the proprietor, the Government inquiry into the death would simply report it as an unavoidable accident, and Government would, of course, be satisfied with such an explanation. It will not do for Government to compare the statistics as to violent deaths in this country with those of coal mining districts. In Ceylon we never hear of explosions of gas, and those who are poisoned by the

carbonic acid which they have been compelled to breathe in the mines will have their deaths attributed to natural causes, and were inquiry made, it might be found that these would be a larger factor than is generally supposed.

In recommending official interference, we do so advisedly, as we feel sure that Government will not make any regulations other than those necessary to keep the mines in a safe and healthy condition, and for a small sum the ventilation necessary can be very simply applied by using a very small air propeller worked by hand, or where two shafts have been sunk, by having a small furnace at the bottom of one of them. In such mines simple contrivances of this kind would be, we feel sure, quite sufficient to meet the approva of a Government Inspector.—*Ceylon Advertiser.*

THE TALGASWELA TEA COMPANY OF CEYLON, LD.

REPORT OF THE MANAGING DIRECTOR.

I visited this estate on May 7th 1890, and submitted to the Directors a confidential report, having previously not made a personal inspection since the land was cleared. In January, 5th and 6th, 1891, I made my second visit and have to report to the shareholders as follows:—

ACREAGE.—The estate consists of 716 acres cultivated, of which 510 acres were planted with tea in May to July 1888, and are now 2½ years old and 206 acres were planted in 1889 and are now 1½ years old. There are large ravines and swamps about the clearings which were planted with tea, but in which it can never be expected to grow, the subsoil being stiff and damp, whilst there is not sufficient fall to admit of efficient drainage. These swamps are now being planted with arecas, and their area will be surveyed, but roughly speaking they are about 35 acres in extent, and reduce the tea clearings to 485 acres, and 196 acres respectively.

SITUATION.—This estate is situated between the Gindura and Bentota rivers, the present outlet is by the former from which the factory is distant about 2 miles. About 15 miles of water carriage brings the produce to Baddegama, which is 6 miles from Hikkaduwa on the Galle road where the Railway will soon be available. An outlet by the Bentota river to Bentota could be made available, this river being five miles distant from the estate.

Rainfall in 1888 was 178·20; in 1889 241·13, falling on 158 days, in 1890 190·93 falling on 153 days. The past year has been a bad one for rainfall at Talgaswela as at many other parts of the country, the S.-W. monsoon months were abnormally dry, and the yield of tea suffered in consequence.

The lay of land is mostly very good for tea, being of a gently undulating character, with a few steep faces only here and there. All the opened land was originally virgin forest.

The Soil is on the whole fairly good, most parts of the estate shewing a really good tea soil, ironstone gravel is very abundant, and experience in the low-country has shewn that this soil is suitable for tea.

Roads and Drains are well cut, and in good order, and all the clearings shew signs of careful work, and have evidently been well opened. I consider that the clearing works reflect credit on the Manager.

The 2½ years old tea is planted in 5 clearings of about 100 acres each, separated by belts of forests No. 1 is a very fine field of tea, a large portion of in is Manipuri indigenous, which is covering the ground well. No. 2 is also a good field. No. 3 is the poorest of the old clearings, as it was chiefly planted at stake, and the jat is inferior to the rest of the estate. It has been pruned low, however, and has improved greatly in appearance during the last six months. No. 4 is a good field. No. 5 is fairly good but there are a few bad patches in it.

The 1½ years old tea is divided into 2 clearings of about 100 acres each, numbered 6 and 7. No. 6 is almost entirely Manipuri indigenous, and is remarkably regular and vigorous. It was planted with transplanters, which have proved a marked success. In No. 7 I regret to say that about 40 acres were again planted at stake, and the original planting was an almost entire failure. About 60 acres of it planted with stumps from an old nursery is most successful. The first supplying during 1890 was very unsuccessful, owing to the partial failure of the S. W. Monsoon. Recent supplyings were more successful, but this work will have to be carefully gone over again this year.

Nurseries are being made in each clearing for 18 maunds seed from Kelvin and Seaforth, and the supplying will all be done with transplanters.

Buildings consist of a well built manager's bungalow, an assistant's bungalow, and various lines, built of cheap materials but sufficient for present purposes as the labour is not resident on the estate.

The Factory is a well built permanent building of brick and timber with an iron roof, 60 ft. long and 40 ft. wide with two withering lofts above the ground floor, one end is temporarily boarded up so that the building can be extended if desired. The machinery at present consists of an "economic" roller, and a double desiccator, but a "rapid" roller, tea sifter and a roll breaker will have to be erected at once. The total cost of this building, dam &c. has been R16,017·66. The work has been well done, but I do not consider that economy has been studied as it should have been, nor was it necessary to erect tats last year for about 6,000 lb. leaf when only a few hundred pounds daily were expected. No proper estimates were made in advance for the various works connected with the factory, and higher expenditure than was ever anticipated has been the result.

WATER SUPPLY.—This has proved most disappointing. The streams in field 3 which we were led to expect could not have been diverted into the lake, and which were relied on by the engineer, Mr. Lamont, in his report of October 1888, cannot be rendered available without flooding a large acreage of valuable tea, and prohibitive cost; and the attempt to divert them into the lake has been a failure and has been finally abandoned. During October the head of water in the lake fell from the normal amount, 5 ft. 3 in., to 9 inches, with the result that the area of the lake was reduced by ⅔rd through sloping of the banks, and the Superintendent was unable to roll the 300 to 400 lb. of leaf that was then coming in as thoroughly as he would have wished, the available power being insufficient for the "economic" roller alone. This was due to an abnormally dry season, the rainfall to October 21st being 100 inches less in 1890 than in 1889, but such circumstances may occur again, and it would not be wise to trust to the chance of a wet season to carry us through the new year. I am therefore of opinion that the immediate erection of an engine is necessary, to supplement the water power. The cost of the repairs to dam, sluice, water wheel &c. amount to 2,478, and to this has to be added about R500 for belts, shafting &c. to connect the water wheel with the main driving shaft, or say R3,000 in all. I do not consider that the water power rendered available is in any way proportionate to the money spent, and am of opinion that it would have been more advisable to have erected an engine at once.

The Present site of the FACTORY is a most inconvenient one for the working of the estate. It is outside the tea fields, and transport of green leaf to it, is expensive. The chief fuel supply is also at a distance from it. A most convenient central situation for the factory could have been chosen near the outlet towards Bentota, giving a shorter transport to the Railway, convenient for the transport of green leaf to the factory, and close to the largest fuel reserves. In view of the considerable expense of rendering the water available, and its small and unreliable power now that it is available, I am strongly of opinion that a mistake was made in choosing the present site at all. On the date of my visit the head of water in the lake was 2 feet 6 inches, and the amount flowing in only supplied the loss by evaporation during the day. In the opinion of the Manager this water will last for 10 days, with 500 lb. leaf per day to manufacture, and unless rain fills up the lake mean-

while, hand power will have to be resorted so. It is for such an unreliable source of power as this that R3,000 has been expended, and the factory been placed in a most unsuitable position and one entailing large extra expense in leaf transport, whilst the manager's bungalow being built near the factory, is in a most inconvenient position for the working of tho estate.

At present thero is no alternative but to erect the engine and continue working in the existing factory, but I am of opinion that at a future date, when the estate is giving a large return and the money can be rendered available, it will be found necessary to erect a large central factory near the Bentota river outlet to which the engine will be moved, the present wheel and factory being kept as a reserve in case of breakdown of machinery.

EXPENDITURE during 1890 has been very low and has shown that expectations formed as to cheapness of labour were well founded. The check roll averages for the month vary from 20 cents to 17 cents p r cooly. Plucking including a most expensive transport of leaf and baskets, is cents 2·42 per lb. green leaf for the year; "weeding" has been R4·20 per acre for the year. These figures I think speak for themselves and show that there is every justification for believing that in cheapness of production Talgaswela estate will be unrivalled when in full bearing. The amount of leaf plucked has been 76,944 lb. of which 8,879 lb. were sold to a neighbouring estate, and the balance resulted in 16,977 lb. made tea.

ESTIMATES for the new year have been framed and show an expenditure of R38,339·63. To this has to be added the cost of a "rapid" roller, a sifter and roll breaker, shafting, and a 14 horse power engine, which will probably not fall short of R10,000.

The yield I estimate at 90,000 lb. made tea, whilst there is every indication of a very heavy yield in 1892, before which the bushes cannot reasonable be expected to bear much.

Arecanuts have been planted through many of the ravines, and this work is being continued.

Labour has been abundant.

Health of labourers has been very bad during the year, fever having been very prevalent.

MINING Operations have been carried on by Mr. W. M. Young who has found indications of plumbago. The company have received as arranged 1/10th of the amount of the minerals obtained. The factory has been painted with materials found on the estate, and the paint seems very good and durable.

The general appearance of the estate is most satisfactory; the bushes are vigorous and shew signs of heavy flushes shortly. The plucking has been most carefully done, showing that Sinhalese village labour, with careful supervision, can be made to do most satisfactory work. I consider that the opening work, and the treatment of the bushes up to date shew signs of hard consciencious work, and I think the estate generally is a credit to Mr. Broadhurst, the Manager, and those under him, and to him I think the shareholders owe a debt of gratitude for good work done under circumstances of great discouragement.

T. C. OWEN, Managing Director and Chairman.

Colombo, Jan. 6th, 1891.

Balance Sheet made up for tho year ending 31st December 1890.

Dr. CAPITAL AND LIABILITIES.

	R c.	R c.
I.—To Capital:—		
2,000 Shares at R100 fully paid		200,000 00
II.—To Debts due by the Company:—		
Baker & Hall for advances	2,087 71	
Rice per Superintendent's report	295 10	
Auditor's fee ...	100 00	
		2,482 81
		R202,482 81

Cr. PROPERTY AND ASSETS.

II.—By Property Immovable:—			
Land: Cost of Land and Cultivation to 31st Dec. '89	R157,771 59		
" Cost of Cultivation this yr.	13,052 23		
Add Usage of Estate Tools &c.	412 49		
	R171,236 31		
Buildings: Cost to Dec. 31, '89		12,598 81	
Further expended this year		3,374 92	
		R15,973 73	
			187,210 04
By Property Movable:—Machinery		4,128 95	
Furniture		1,486 68	
Stock: Tools, Carts, Boats, &c.		2 284 06	
Less Usage of Tools, &c.		412 49	
		R1871 57	
			7,487 23
IV.—By Debts due to the Company:—			
Lessee of Riseland Estate for tea leaf sold			684 80
V.—By Cash:—Balance for Supt.'s report			1,325 17
VI.—By Profit and Loss Account:—Balance			5,775 57
			R202,482 81

Profit and Loss Account made up for the year ending 31st December 1890.

Dr. Dec. 31st, 1889.			R c.
To Balance brought forward	...		5,800 76
Dec. 31st, 1890.			
To Proportion of cost of Cultivation of Estate on that portion yielding leaf	...		5,500 00
To Office Expenses	...		881 43
To Auditor's fee	...		100 00
			R12,282 19
Cr. Doc. 31st, 1890.			R c.
By Sale of 13,137 lb. made Tea		R5,542·47	
By Sale of Tea leaf		709·91	
			6,252 38
By Timber sold	...		41 00
By Profit on Rice	...		186 72
By Transfer fees	...		13 50
By Interest from Bank	...		13 20
By Balance	...		5,775 57
			R12,282 19

(Signed) JOHN GUTHRIE, Auditor; BAKER & HALL, Agents and Secretaries; THEO. C. OWEN, Chairman; G. CHAPMAN WALKER, G. W. SUHREN, F. C. LOOS, T. WATSON HALL, WALTER AGAR and SHELTON AGAR, Directors.

Colombo, January 1891.

COTTON-PICKING by machinery is one of the recent innovations that have come to stay. A bale of cotton is on exhibition at Memphis, Tenn, which was picked by machinery. The bail weighs 475 pounds and was picked in two hours during a rainstorm—equal to the work of fifteen men. The cotton is much cleaner than when gathered in the old way, and will bring nearly half a cent a pound more. —*Planters' Monthly*.

GRAIN DIAMONDS, or rough brilliants, have been discovered in specimens of rock sands forwarded to M. Charles Velain, of Paris, by M. Charles Rabot, from Russian Lapland. The diamond-bearing sand was taken from the valley of Pasvig, and is the *débris* of granite. M. Velain, in a memoir to the Académie des Sciences, states that the gems, which are very tiny, may have come from the demolition of pegmatite in the district. This is the first time that diamonds have been found in European soil. —*Globe*, Feb. 6th.

THE GIGANTIC EARTHWORMS OF CEYLON.—The *Quarterly Journal of Microscopical Science* for January contains a paper on *Megascolex cœruleus*, Templeton, from Ceylon; together with a theory of the course of the blood in earthworms, by Dr. A. G. Bourne (plates vi. to ix.) During a short visit in 1889 to Ceylon the author obtained thirty-eight species of earthworms; only seven of these have been found in India, and about twenty-nine Indian species have not yet been found in Ceylon. The author summarizes his theory of the circulation as follows: the vascular system consists of a portion in the cephalized region, and of other portions metamerically repeated in all succeeding segments. The cephalized portion differs only from that occurring in any other segment in having undergone a synthosis, and also in the presence of contractile hearts. Throughout the body, blood is forced from the contractile vessels into the peripheral networks; thence it is conveyed by a system of intestino-tegumentary vessels to intestinal capillaries, and from these it returns to the contractile vessels.—*Nature*.

THE PUBLIC AND PRIVATE SELLING OF TEA.

We had brought to our notice a short time back the opinion held by Mr. J. Roberts of Messrs. S Rucker & Co. as to the probable effects of the system under which a not inconsiderable proportion of the produce of our tea estates is sold. We are not personally concerned as to whether that opinion can be justified to the extent which Mr. Roberts evidently thinks that it can be; but the views entertained by so good an authority should certainly receive every consideration. But we were not prepared to learn as we have lately done, to how great an extent the system of selling tea through the agency of private friends at home has spread. We have only recently been told—upon good authority—that the produce of one tea estate in Ceylon, which yields annually some 55,000 lb. of made tea, had been sold through such an agency to the large figure of 45,000 lb., and that confident hopes were entertained by its proprietors that the balance which has hitherto had to be parted with in the open market will, during the present year, find customers through the same private channels.

Our informant in this matter tells us that for the quantity thus disposed of privately, the proprietor of this particular estate, netted for the entire quantity fully threepence per pound more than he would have done had he sent his crop to market through the ordinary channels. If we may accept this statement as being fully reliable, there can be no doubt that the system of distribution adopted must present very enticing advantages and, despite the threat held out by Mr. Roberts that in such cases of its adoption as may become known brokers in Mincing Lane would practically boycott the teas of their offending proprietors, there can be little reason to think these threats can be productive of much effect. Every one of our planters would, if they cou'd, resort to any justifiable means for obtaining the highest returns possible for his teas. But we should be inclined to think that the circle of those who could achieve the success above recorded, must be a very narrow one indeed. As was remarked in London to our correspondent, very many of our estate proprietors are bound by the conditions under which they have obtained financial help, to ship all the tea they can grow to the parties who have so assisted them. This restriction must certainly prevent a very large number of Ceylon tea planters from even attempting to enter on the course of parting with their teas through any private or friendly agency.

Of course we can realize that, as has been pointed out by Mr. Roberts, the brokers in Mincing Lane, the men who make their livelihood by public dealing in tea, must regard with strong disfavour a system which operates to diminish the bulk with which they have to deal. If the fact be as stated that an additional profit can be secured to the grower of threepence (or even twopence) per pound on all teas so privately disposed of, we may be sure that to that extent the brokers and other middlemen will be deprived of profit. It must be natural that the trade in London should not complacently view what it will doubtless consider to be an encroachment upon their just rights. Free trade in the abstract has a host of supporters; but when the application of its principle injuriously affects personal pockets, these principles are in such cases not quite so thoroughly appreciated. It would be no surprise, therefore, to us to learn that every legitimate means would be used to prevent their application in this particular case of the private distribution of tea. While admitting that they cannot help the exercise of private right to dispose of crops to the best advantage of the grower, the brokers, we can well understand, might in self-defence say:—"Well if you *will* go behind our backs and employ what is practically an unpaid agency, to the exclusion of ourselves from sharing in your profits, when you *are* forced to come to us we will soon shew you that we will have *all* your favours or none at all. We will not consent to be made a simple convenience of."

So far as we are personally aware there has not as yet occurred a single case of this nature. We have not heard of the product of any Ceylon tea estate having been thus "boycotted" in the Mincing Lane Sale Rooms. Nevertheless it would not be surprising if such instances did eventually come under observation, and those who are practising this system of being their own distributers will have to reckon how far the advantage gained might be counterbalanced by a practical exclusion of their teas from public competition. For, it is possible, that when teas are sold privately in the way pointed out with an established price, any attempt at advantage through a sudden rise in the public price of tea might have to be sacrificed.

THE YATADERIA TEA CO. OF CEYLON LTD.

To the Editor of the "Ceylon Observer."

Colombo, Feb. 26th.

DEAR SIR,—I send you herewith report proceedings at the Annual Meeting of the shareholders of this Company held yesterday together with the Report of the Directors.—I am, dear sir, yours faithfully, B. G. L. BREMNER, Secretary.

GENERAL MEETING.

The third annual general meeting of the Yataderia Tea Company of Ceylon, Limited, was held at the Offices of the Company, 13, Queen Street, Fort, Colombo on February 25th, pursuant to notice.

Mr. H. V. MASEFIELD in the chair and the following shareholders were present:—Messrs D. Fairweather, John H. Starey (Managing Director), J. R. Fairweather, E. S. Anderson, G. W. Carlyon, and B. G. L. Bremner (Secretary), and by Attorney Mr. W. Church.

The Secretary read the notice convening the meeting.

The minutes of the last annual general meeting were duly confirmed.

The report of the directors having been taken as read Mr. H. V. MASEFIELD moved its adoption. The Managing Director in seconding the motion offered the following remarks upon the accounts and business. He had to point out a slight misprint in parenthesis in the profit and loss account: the amount written off for depreciation should be R11,051 instead of R10,826. The actual profit for the year was R34,602·18 being rather over 18 per cent, but in no case would the amount written off for depreciation have been available for dividend in view of the resolution of the two previous general meetings to keep capital account down to R350 per cultivated acre. The cost on Board might be considered satisfactory. The item for interest was not likely to recur. The question of paying an interim dividend last October had been carefully considered by the Board, but as exchange was rising and tea was weak on the market, and as the money must have been borrowed it was decided to defer such a division. The cost of the Factory had been R19,434, which seems large, but it was constructed under exceptional difficulties and is a thoroughly satisfactory building. In expectation of large crops it had been deemed expedient to build another wither-

ing house and to supplement the machinery with an engine and boiler and another Dryer. Part of this machinery was already on the estate and being erected, R5,000 part cost being included in last year's accounts. A new withering shed in course of erection was estimated to cost about R10,000. Only 6 acres had been added to the cultivation last year but 40 acres are to be cleared and planted this season. We had purchased about 53 acres at the land sale yesterday, certain lots applied for having been withdrawn. 14 new shareholders had joined the Company. No shares had changed hands below R100 (par) and recent sales had been at R150 per share. The value of the shares which had risen to 50 per cent premium before any dividend had been paid proved the wisdom of the policy hitherto followed by keeping down the capital account, for the shareholders had gained in improved value more than could possibly have been paid as dividend while maintaining a strong position in the balance sheet instead of a weak one.

Certain questions having been replied to, the report was then adopted.

Mr. ERIC S. ANDERSON proposed that a dividend of R12 per share for the year ended 31st December 1890, being at the rate of 12 per cent per annum be declared and made payable on 28th February. This was seconded by Mr. J. R. FAIRWEATHER and carried.

Mr. D. FAIRWEATHER moved and Mr. E. S. ANDERSON seconded the re-election of Mr. J. H. Starey as Director which was carried.

Mr. E. S. ANDERSON proposed and Mr. G. W. CARLYON seconded:—"That the amount allotted for Directors' remuneration, Secretary's salary and office rent be increased from R1,600 to R2,500 subject to revision should dividend fall below 10 per cent."

The Managing Director having explained how the office work and business of the Company and the calls upon the Directors' time had greatly increased; in some particulars to treble the former volume, the motion was carried.

Mr. G. W. CARLYON proposed and Mr. C. M. GWATKIN seconded:—"That Mr. John Guthrie be re-elected Auditor at a fee of R100 per annum."

Mr. CARLYON proposed and Mr. E. S. ANDERSON seconded a cordial vote of thanks to the Directors and office-bearers which was acknowledged by the Chairman who added that while the vote was very gratifying it was particularly deserved by Mr. Fairweather, the Superintendent of estates.

"The Directors have the pleasure to submit the Balance Sheet and Profit and Loss Account for the year ending 31st December 1890, duly audited.

"The balance at credit of Profit and Loss Account at 31st December 1889, having been written off to immovable property, as resolved, there is no balance brought forward. The net profit for 1890, after writing off for depreciation, as shown by the accounts, is R24,551·18, and the Directors propose that a dividend of 12 per cent, absorbing R22,800 be declared and made payable on the 28th of February and that the remainder of R1,751·18 be carried forward.

"It will be seen that the property representing capital stands in the balance sheet at approximately R350 per acre cultivated in terms of the policy resolved upon in general meeting; cost of a steam engine and boiler and rapid roller not ready for use is included. An additional withering house is being built, and another drier is in order, to meet the requirements of the increasing crops; while the superintendent's permanent bungalow has yet to be built. Hence it will be understood that in 1891, as hitherto, all the earnings of the company will not be available for dividend, though they accrue to the proprietors in the value of their shares.

"The total tea crop was 246,653 lb. or 54,653 lb. more than estimated in last report. The plucking area was 480 acres, of which 100 acres were plucked only for 8 months. The yield is shown below.

"The total quantity of tea for disposal was 248,887 lb. which included 2,234 lb. tea made from purchased leaf, 98,211 lb. were shipped to London, and 150,676 lb sold locally. The cost of tea, including all charges, depreciation, and interest, was 30·9 cents per pound. The net value realised from sales was 40·7 cents per pound, the market having ruled lower than in the previous year; while the large yield was necessarily not of the highest quality and value.

"The Company's property consisted at 31st of December 1890, of 529 acres of Tea, viz:—

Acres			per acre. lb.
172	Tea planted in 1885	yield in 1890	723
208	do '87	do do	483
100	do '88	do do	217
43	do '89	(not in bearing)	
6	do '90	do	
354	acres Forest		
883	acres total.		

"In consequence of disappointment at the land sales, only 6 acres were planted in 1890; about 40 acres are being opened this year. Certain small additions applied for are advertized for Government sale on the 24th instant.

"The estimated crop for 1891 is 300,000 lb.

"Mr. J. H. Starey retires from the Board by rotation, in terms of the articles of Association, but being eligible, offers himself for re-election.

"The shareholders will be asked to elect an auditor for the current year.—By order of the Directors,

"B. G. L. BREMNER, Secretary."

Colombo, 14th Feb.

Balance Sheet at 31st December, 1890.

Dr.	LIABILITIES.		R.
I.—To Capital— 1,900 Shares of R100 each, fully paid...			190,000 00
II.—To Debts of the Company—			
Sundry Creditor Balances	...R2,452 18		
Due to Superintendent per Estate Report, December	...R8,944 28		
Due to Auditor ...	...R 52 50		
			11,448 96
VII.—To Profit and Loss Account— Balance as per Account			24,551 18
			R226,000 14

Cr.	ASSETS.			R. c.
III—By Property (Immovable)—held by the Company—				
(a)—Land as per last Report	...R161,259 69			
Add Land purchased ...	575 17			
		R161,834 86		
Deduct Profit to 31st December, 1889, transferred ...		8,981 09		
			R152,853 77	
New Tea Clearing 1890, (6 acres) ...			891 14	
Buildings—				
As per last Report	...R 15,207 50			
Add Balance of New Factory Cost ...	7,120 75			
		R22,328 25		
Less written off (say one-fifth cost) ...		4,973 00		
			R17,355 25	
				11,100 16
(b)—By Property (Movable) held by the Company—				
Machinery as per last Report	.. R 15,507 20			
Add New Machinery ...	2,677 78			
		R 18,184 93		
Less written off (say one-third cost) R6,078 and sold R400 ..		6,478 00		
			R11,706 98	
New Machinery (not erected)			5,000 45	
				16,707 43
IV—By Debts to the Company—considered good—				
Coast Advances			R7,232 67	
Estimated Value of Tea not sold (since realized)			23,202 27	
				30,434 94
By Expenditure on Account Crop 1891— ...				1,995 51
V By Cash at Bankers—				5,762 10
				R226,000 14

Profit and Loss Account for the year ending 31st December 1890.

Dr.	R	c.
To Profits to 31st December 1889, tranferred to Cost of Land as per Balance Sheet	8,981	09
To Cost of Growing, Making, Transport, &c., Tea Crop, 1890 (including R11,051 depreciation)	73,024	28
To Directors' Fees, Secretary's Salary, and Office Rent ...	1,600	00
To Interest ...	2,018	16
To Auditor's Fee ...	52	50
To Statiouery, Postages, aud Sundries ...	81	87
To Balance	24,551	18
	R101,327	99
Cr.	R	c
By Balance of Account at 31st December 1889	8,489	93
By Value of Tea on account 1889 realised in excess of the sum estimated ...	491	16
	R8981	09
By Transfer Fees ...	60	00
By Net Sale Proceeds of 248,887 lb. Tea (including value of Tea not sold in December as per Balance Sheet) ...	101,267	99
	R101,327	9

TEA AND COFFEE IN NUWARA ELIYA DURING THE "FORTIES."

With reference to the tea planted at Nuwara Eliya under the care of the Rev. Mr. Gepp (uncle of Mr. Gepp, Colombo), when living in Sir Anthony Oliphant's family in the early " forties," it is interesting to know that some of the seed or plants of the same or a subsequent supply were given to the late Mr. Cornell who put them in on his Essex property. Mr. A. J. Kellow writes :—" I have now got the local history of the tea plants I lately referred to. Mrs. Bullock tells me that Mr. Cornell planted a few at Essex Cottage (now Naseby) in 1847 and they grew to be very large trees. They were put in where the old bungalow stood and were the same that I wrote to the *Observer* about in 1873. Were you aware that the late Capt. Fisher tried coffee in Nuwara Eliya? The patch is still to be seen, but I do not know if any of the coffee trees are in existence. Mr. Nock and I purpose going up some day to see."

TEA IN THE UNITED STATES seems at length to have taken a start upwards. From a value of $14,179,000 in 11 months of 1886, there was a fall to $10,658,000 in 11 months of 1889. For the 11 months of 1890 there was a rise to $13,400,000. The imports of coffee have gone up from a value of $39,922,000 in 11 months of 1886, to the enormous figure of $78,266,000 in the 11 months of 1890, or 6-fold the value of tea.

THE RABBIT PEST IN AMERICA.—It is not only in Australia that rabbits have increased so as to be formidable enemies of farmers. A paragraph quoted in the *Indian Agriculturist* runs thus:—

In many localities in the Western States of America rabbits have become a serious pest. For a time the price paid for them had induced hunters to kill many of them but notwithstanding this they have increased and the larger numbers offered the city dealers have brought prices to the point that will prevent an increase in the number killed. In some places it required four rabbits to bring 5 cents last winter, and the hunters quit in disgust. It is probable that before long several States will find it necessary to take measures for the destruction of rabbits.

SETTLEMENT AND EXTENSION OF NATIVE CULTIVATION IN CEYLON: BIG TANKS A NECESST Y.

We direct attention to the following mature opinions on the best means of promoting new settlements and the extension of native cultivation They are from a resident as competent as any man in the country—and far more so than speakers and writers who have never spent a month continuously in a purely native district—to advise authoritatively on the subject. What is said about big tanks deserves careful consideration, more particularly when we remember that it took twenty years to demonstrate the full success of the Batticaloa tank works begun by Sir Henry Ward and Mr. J. W. W, Birch.—We quote as follows:—

"I have thought the matter well over ; and my conclusion is that (with exceptions here and there) we are settling up the island quite fast enough, and that the only impetus required is to give the land (waste) on very easy terms, whether to the poor man or the capitalist, if he will accept it in unsettled parts, where at present there is no demand. I do not believe in dealing out money to make settlements, though I would give it to a 'Zemindar' as they would call a large landlord in India—especially a European, if he would undertake to clear and settle a number of families in any place. Of course they would first come as coolies, and the most industrious would in time become tenants. But disappointment would come I think if money was given direct into the settler's own hands.

"Of course where paddy cultivation is to be encouraged—and it is and will long be *the* branch of agriculture the natives best take to—irrigation must be provided, and must keep pace with the cultivation *which it has not done in the past*, coconuts, cotton, &c. follow.

"Wherever the population in the island is dense, there is always not far off a 'hinterland' into which it has been for years spreading, extending and occupying. Open this up with good roads and you will help and attract settlers.

"Matara is now flowing over into the Giruwa Pattu; and before many years the country under the Walawe works will be occupied. Civilization it is said spreads from centres, and we must work for the extension of the cultivated area on the same principle in Ceylon. But you must have a bold policy, not hesitating to launch out because there is a doubt if 'it will pay,' and not frittering the revenue over village tanks, which are a snare and a delusion as a rule, and *pro rata* much more expensive than the big works, as was shown in your columns some years ago.

"I see a great deal of nonsense has been recently talked and written about Kalawewa having failed. Of course it will not fill when the monsoon fails, but in the first place such failure is *not the rule*. Next my experience shows, if the rain does not come at one time, it does at another part of the year, as it has done this year. and having a big reservoir ready, we are able to *bottle* up a lot and keep it until required, and once you get one of these big tanks full, it is wonderful how it can be eked out. Suppose, as is frequently the case, the rains are short or late, there is little or no cultivation, and much of what did come at length would be allowed to run off. But with a big tank, it is *all saved*, and with this behind them, cultivators go on merrily. The tanks and works in Batticaloa and Matara were decried just as Kalawewa is now; but they have lived it down and so will Kalawewa."

SHARPE'S PATENT AUTOMATIC TEA DRYING MACHINE.

This is "another Richmond," and the inventor, who is at present amongst us, only asks a fair field and no favour. Mr. Sharpe leaves for the tea districts of India very shortly: meanwhile, he has given Ceylon the first opportunity of seeing what his automatic drier can do.

He has engagements to erect other and larger machines in Assam, and elsewhere, and is full of hope that the merits of his machine will in time win for it a good place in the race. While fully satisfied that the drier is second to none, he does not claim for it that it is yet a perfect machine, but he hopes, that after some little time in use, he will learn wherein it may be improved, and is anxious for practical hints. There is one thing however on which he takes his stand and that is that his drier will be made to turn out the quantity of tea it professes to do—a one maund machine will deliver 80 lb. an hour, and not 60 or 70 lb. If this is done it will be a boon, for how seldom do we find manufacturers' estimates to agree with those of practical men. A description of this new drier cannot be better given than in the words of the inventor. He says:—

The machine consists of a cylindrical casing, in the interior of which a number of horizontal perforated trays, fixed on a vertical spindle, are caused to revolve by a suitable system of pulleys, belts and geared wheels. The trays are divided into a number of sectors or flaps, each of which is hinged on the frame of the tray on one of its radial edges, the other edge remaining loose, whilst the sectors are maintained in a horizontal position by flat circular supporting rings of somewhat smaller diameter than, and suitably arranged within, the casing. At a certain point a portion of each of these flat rings is cut away, so that the loose edge of each of the sectors or flaps on reaching that point falls, and the leaf on the sector is deposited on the tray below. The leaf, spread wet on the uppermost tray through an opening in the top of the case, is carried round through one revolution of each tray and then dropped on to the tray below until the bottom tray is reached, the leaf being evenly distributed over the surface of the trays by means of adjustable regulators. The fully dried tea falls from the bottom tray into a spout or shoot which conveys it into a proper receptacle placed to receive it. The fine tea or "dholgoorie" falls to the bottom of the machine, where it is received by a non-perforated revolving tray which delivers it automatically into a separate receptacle.

The heated air from the furnace is drawn up through the perforated trays and the superincumbent tea leaf, and is driven out of the casing by means of powerful exhaust fans fixed on the top of the machine, but no light leaf is carried away with the current of air, as is so often the case when exhaust fans are used.

By means of a pair of cone pulleys the speed of revolution of the trays may be varied within all practical limits, so that the duration of exposure of the leaf to the heated air may be regulated with great nicety.

A number of openings are made in the casing, each provided with a close-fitting door, so that the process of drying may be examined at any stage. These openings also give easy access to the interior of the machine for repairs. The lubrication of the bearings is so arranged that no oil or grease reaches the interior of the machine.

The furnace consists of a fire-grate of large area enclosed in a fire-brick flue, from which the heat is conveyed by suitable ports to a brick chamber, in which are arranged a number of cast iron tubes held in position by cast iron tube plates at either end. Baffle plates are so fixed as to ensure thorough circulation of the heat amongst the tubes. A wrought iron chimney, fitted with a damper, secures the necessary draught and carries away the smoke. Openings with doors are provided for cleaning the tubes and flues, and of examining the interior of the furnace.

The machine is attached to the tube plate at one end of the air-heating tubes, the opposite ends being open. The air is drawn through the tubes by the before mentioned exhaust fans, becoming heated on its passage. Special means are provided for making a perfect joint between the tubes and tube plates, so that there is no risk of deleterious fumes or gases from the furnace gaining access to the interior of the drier.

A thermometer is fixed to the machine, by attention to which the furnace attendant may easily maintain an uniform temperature. Should the heat, however, become excessive, it may instantly be reduced by admission of cold air through valves provided for the purpose.

On Wednesday, Mr. F. D. Philips of Hangranoya on whose estate this tea drier has been put up, held a public trial, which was seen by a number of planters from different districts. The inventor was somewhat at a disadvantage, as there had been much delay in getting a pulley, and it was only the day before the public exhibition that the machine could be run at all. The tea was fired at a very much higher temperature than we are accustomed to, but at the first trial the maund was not managed by the hour. The tea seemed to run a considerable risk of over-firing. During the second trial, a change was made in the cone pulleys, which brought the tea out very much quicker, but it was hardly fired enough. The quantity however was very much increased, and it was clear that an intermediate pulley would effect all that was wanted both as to quantity and condition. If Mr. Sharpe had had more time, this would have been seen to before the public were invited to criticise.

The feeding too was wanting alteration: it was too primitive; but this is to be attended to, in fact an automatic feeder will be supplied. The machine is very strongly built, and it *was* warm. I don't know that I ever was in a tea house with so high a temperature: a wooden casing with asbestos packing will soon put that to right, and save fuel.

By-and-bye this new machine will have a fairer trial than it had on Wednesday, and it is only when it is in good working order that a reliable report of its doings can be given. Meanwhile it is pretty clear that the principle of the machine is a good one, and it is only minor matters which want a little adjusting. Mr. Sharpe was very anxious for practical suggestions, and it seemed to me that he got this. Perhaps he got more, for the planter is sadly wanting in reverence, and when they gather together in a critical spirit there is a good deal of amusing effervescence.

Mr. Phillips hospitably entertained the company at breakfast and tiffin: at the latter meal, success to the drier and the health of the inventor was enthusiastically drunk. Mr. Phillips' health too was also proposed. Altogether the gathering was an enjoyable one.

COTTON SPINNING IN CEYLON.

Bombay millowners will learn with interest of the early experiences of the pioneers of mill enterprize in Ceylon. A year or two since a Company was formed for establishing a spinning and weaving mill at Colombo, the first we believe in the colony. Some of the lessons taught by Bombay experience have been carefully taken to heart by the Ceylon Company. The quarter-anna per pound rate of remuneration for the agents has not been introduced; if it had been, it was pointed out at the meeting of the company last month, the agent would have "walked away with the whole of the profit balance." In some other respects, however they do not manage things better in Colombo than we do in Bombay. As only half of the capital of eight lakhs has been issued the company is in need of money to pay for its machinery and other purposes, and as the shares are at a discount of nineteen per cent the directors think it better to raise money for immediate requirements either by loan or in debenture stock. If, as one of the promoters said at the meeting the other day, the company can make more than enough to cover bank interest it is better for the existing shareholders not to issue the balance of their capital; but in that case the chairman's reference to the company having been crippled for want of money was much too pessimistic. It seems as though the Ceylon mill were no more free than other mills have been from the inconvenience attendant upon having started with too little capital. The company has difficulties probably not insuperable, in other directions. It has not yet solved the problem of cotton supply, and it has had to solve its labour problems in a somewhat expensive way by importing skilled hands from Bombay and Madras. The labour difficulty is one which the directors do not underestimate. The Cingalese labourer, in addition to being as yet untrained, is very irregular in his atten-

dance at work—a fact which would have to be borne in mind if at the instigation of the Holt Halletts of the future a Factory Act were to be imposed upon the as yet undeveloped textile industry of Ceylon. Apart from these difficulties, however, the company is able to give a good account of its operation and prospects. The manager extols the Ceylon climate as perfect for cotton spinning and weaving. It is never too dry, and the excessive moisture of the rainy season is easily overcome by artificial means. He has some of Dobson and Barlow's best plant to work with, and boasts that the quality of his yarn and cloth is superior to that of the products of the Indian mills, and very nearly equal to English. He would be a singular manager if he said anything less than this. However, the experiment will at all events be interesting enough to be worth watching. Cotton spinning in Ceylon must necessarily be carried on under difficulties, and these have not been reduced by starting the enterprise with something less than half the requisite capital. But the company seems hopeful enough, and if hope could assure success this ought to prove a prosperous concern.—*Bombay Gazette.*

EAST AFRICA;—THE BRITISH, PORTUGUESE AND GERMANS—AND THE PLANTING SETTLEMENTS.

We have had an interesting conversation today with Mr. A. Carnegie Ross, British Vice-Consul at Quilimane in Portuguese East Africa. Mr. Ross is married to the second daughter of the late Mr. R. Boyd Tytler and our readers will remember the graphic description of a Christmas experience at Quilimane by Mrs. Ross which we published a short time ago in our *Literary Register*. The connection of Vice-Consul Ross with Ceylon is therefore a close and interesting one and it is no wonder that when the time came for a holiday and the opportunity of a steamer offering, Mr. Ross should take passage in the S. S. "Clan Mackay" for Ceylon; and after spending a thoroughly enjoyable holiday with his relatives, Mr. and Mrs. Vollar and the Messrs. Tytler here, he is now voyaging to London by the B. I. S. S. "Goorkha" which left here this afternoon. With all the stir about East and South African affairs at home just now, Mr. Ross's presence and experience will be very acceptable.

Mr. Carnegie Ross—who is tall, slim and wiry, a keen hard-headed Aberdonian of the intellectual type,—has been in East Africa for six years. He came out as Agent for the African Lakes Company and later on combined this Agency with the British Vice-Consulship at Quilimane, the capital of the Portuguese Settlements. His office there has, as may be imagined, not been a bed of roses for the past year or so; but though he has had very amusing, as well as perhaps annoying experiences, he has managed to maintain not only peace, but even friendship with the leading Portuguese officials, and he is so well-known among them as well as their half-caste and native employees to be a man of his word, that no interference with him officially or personally has ever been attempted. As administrators, colonists or settlers, or even as merchants and traders, the Portuguese are beneath contempt. They have never done, and never will do, anything with their African territory: and they might as well try to mop back the Atlantic as try to prevent the spread of British and German influence. Mr. Ross expects that with the advent of Mr. H. B. Johnston, C.B., as British Commissioner for the territory, the Zambesi will be thrown open for general traffic for all its navigable length and any barrier attempted by the Portuguese will be promptly though peacefully removed. Mr. Ross speaks very highly of Mr. Johnston's capabilities, as also of Mr. Joseph Thomson, another well-known explorer and geologist, now at the head of an expedition to the West of the settled territory, among his staff being Mr. J. A. Grant, a son of Colonel Grant (of Speke and Grant African fame); and also of Mr. Cecil Rhodes and the South African Expedition and settlers. Mr. Ross has often made the trip up the Zambesi 400 miles to the Blantyre Mission and the Shiré Highlands, the headquarters of the East African Lakes Company. This is chiefly a Plantation Company, and its leader Mr. Buchanan (although without any experience as a planter) guided by our Ceylon Planting Manuals and the *Tropical Agriculturist* which he gets regularly, has opened and planted a considerable extent with coffee which is flourishing though there is some talk of "borer" and other troubles. Mr. Ross shipped 200 cwt. of the coffee in the "Clan Mackay" at Quilimane, and seed he has given Mr. Vollar has already been planted in Dumbara to see how it will turn out. Labour is described as very cheap, a few silver coins a month, or a piece of calico ensuring willing labour. The Shiré Highlands up to 3,000 feet altitude, but some 18° from the equator, seem intended for a coffee country from the account given of them. Cinchona has also been tried on a moderate scale. One Indian planter has established himself near Blantyre (marrying a lady of the Mission) and has now a promising coffee garden. Of course, the cost and difficulties of transport are the great drawbacks. Mr. Ross, with his knowledge of the country and people, has made the journey in three weeks; but ordinarily six weeks are required between the Blantyre Settlement and the Coast. The only Ceylon man who has turned up is Mr. Henry Brown (formerly Inspector of Police in Colombo and coffee planter in Matale). He has gone up the Zambesi in a native boat to get to the planting settlement—this being the cheaper though much longer way of going. By the solitary steamer which runs on the Zambesi for 400 miles at intervals, the passage is £20 sterling. Mr. J. R. W. Pigott, formerly of Dikoya and Matale, is in the employment of the Imperial British East African Company, working much farther north. His station is Mombassa and the Company's work is chiefly administrative so far, no planting having been done. Indeed there is enough to do to keep the Arabs (slave dealers) in order in that district, while farther south near the Zambesi, no Arabs have yet found an entrance and the natives are tractable and easily managed if only fairly dealt by. East as well as South Africa is bound to be opened up and the highlands to be colonised at a rapid rate in the next few years. One drawback at present is that the British India Company have ceased to send their steamers farther south than Zanzibar, while the Donald Currie line seldom come to Quilimane. A coasting service for the whole of the East Coast would be an advantage, and there ought to be abundance of traffic both in passengers and goods if connected with the Cape service and with European lines say at Aden.

We wish Mr. Carnegie Ross a pleasant trip home and a profitable stay in the old country, and afterwards a return in due season with Mrs. Ross to his adopted home, with speedy promotion soon to follow in view of the rapid development of East Africa both in plantation and mining settlements. We are sure to hear of Mr. Ross's name in responsible positions as time rolls on. His principle of righteous dealing with the natives has evidently been in contrast with some of the doings of Stanley and his followers, and this has served to make his name well-known and appreciated along the Zambesi and neighbouring territories. It is

quite evident that Lord Salisbury does not mean to give up one inch of the territory recently exploited by the South African Expedition. Five hundred carefully selected men of this Expedition since disbanded, have now taken up allotments chiefly for mining purposes and nothing can ever alter the British character of the grand territorial area so occupied and settled. The exports of gold from this quarter will soon show how rich is the country in auriferous wealth and the usual rush of population from Australia and the mother-country may be expected to follow.

PREPARATION OF CACAO IN CEYLON.

[*From the "Trinidad Agricultural Record" for Jan. 1891.*]

Royal Botanic Gardens, Peradeniya,
24th October 1890.

The Hon'ble the Colonial Secretary, Colombo.

Sir,—In returning to you His Excellency Sir W. Robinson's letters forwarded to me with your letter No. 33 of 20th October, I have the honour to express my pleasure that the information I was able to afford proved so much to the point as regards the inquiry upon which he was engaged. I beg that you will convey my thanks to His Excellency for the copy of his article, and in accordance with his request that I would make a few additional remarks, I beg leave to offer the following observations suggested by its perusal:—

1. Though we have now pretty well settled the point (long in doubt) that the "old red Cacao so long cultivated in Ceylon is that known in the West Indies as Criollo or Caràcas," it should be borne in mind that it is now by no means the case that all the Cacao sent from Ceylon to the London Market is of that variety. Of late years a good deal of Forastero (and that of numerous sorts) has been grown: and the opinion of planters is by no means universally in favour of the Caràcas variety. For in the market the two sorts are often very evenly priced. Thus, lots of the two kinds grown on the same estate and kept carefully separate and sold on the same day in March last in London, fetched respectively per cwt:—Caràcas, average 106/7¾; Forastero, average 107/.

I am not aware on what evidence Mr. Morris's statement that Ceylon is indebted for Criollo Cacao to the Dutch is based. It may be correct, but the earliest record I have met with of the plant in the Colony is 1819, and I believe it to have been then quite recently introduced. This would be some twenty years after the British occupation. But there is no record of whence it was obtained, nor is there any certainty that it was of the Criollo variety, though this is probable. What is certain is that the great bulk of the Caràcas Cacao in Ceylon is descended from a consignment of seedlings obtained in 1834-5 by Governor Sir W. Horton from Trinidad.

The general difference of the two sorts as grown now in Ceylon could not be better described than in the words quoted in Sir W. Robinson's paper (p.p. 3, 4) from the *Agricultura Venezolano.*

3. His Excellency rightly dwells on the importance of careful artificial drying in wet and sunless weather, but there is another point in which Ceylon practice differs from that followed in the West Indies to which he has scarcely alluded. That is the washing of the seeds. None of the mucilage or pulp is ever allowed to dry on the bean; all is carefully washed away by copious and repeated ablutions.* It is this especially that gives the Ceylon product the clean "bright" look that is appreciated in the market. I should, however, remark that the attention of the Trinidad cultivators has been already strongly called to this in an article by Mr. Preston in the *Trinidad Chronicle* so long back as 1883. HENRY TRIMEN.

* The Editor of the *Trinidad Agricultural Record* holds that there is consequently a loss of 20 per cent in weight and that therefore 64/ per cwt. for Trinidad cocoa is equal to 81/ for Ceylon.—ED, *T. A.*

It is very important for our readers to bear in mind, that *Criollo and Forestero* do not respectively stand for the types of *Ceylon and Trinidad Cacao.* Ceylon has both the varieties no doubt *pure* and they may be of equal value—with us both types have degenerated and are characterised by a large proportion of *very* flat beans. That is our difficulty.—ED.

NATIVE AGRICULTURE IN INDIA.

You may train up a child in accordance with the most beautiful theories in the world, and the result will be disappointing if you do not feed him at the same time. Here in India we have an immense number of people living on the verge of starvation. We cannot feed them, and those who are grown up must continue to find their way to Nirvana with a stomach seldom or never full and very often empty; but if we can bring ourselves to abjure the words of antiquated masters, we may be able to do something for the children of the rising generation by teaching them to find more food for themselves. The discovery of a new art, the adoption of an improved process, the invention of a new implement, each and all are equivalent in an agricultural community to the finding of a great granary, the existence of which was hitherto unexpected, and there is no good reason to suppose that the arts, processes and inventions suitable for the tillage of Indian soil have already been perfected. The native cultivator is no doubt, when the hopelessness of the struggle to better his position does not drive him to despair, wonderfully skilful up to a point; but it is the point where science only begins, and to say that the discoveries of physical and mechanical science have nothing to teach us in agriculture is to shut our eyes to the experience of Europe during the last hundred years. No doubt the native cultivator thinks he has got as far as he can: Squire Western also would have laughed at the notion of a steam plough: but this is no reason why those who know better should agree to think so, or despair of persuading the native to change his mind.

Past experience, however, with its record of abortive experimental farms stored with model implements never leading to copies, shows that to attempt this from the top is to attempt an almost impossible task. We must begin at the bottom: we must take the child, while yet years of routine on the paternal homestead have not induced the conviction that his father knew as much as it was possible to know; we must teach him first of all to look on agriculture as an occupation in which improvement is always possible; and we must impart just such a rudimentary instruction as will give him a glimpse of the direction in which this improvement may lie, and inspire him to take that road. When we have done this our experimental farms, our agricultural exhibitions, our scholarships to send one or two in a hundred and fifty millions to a technical English school, will catch on, if we may use an Americanism, in a way they have never done before. Sir Edward Buck stated that proposals for carrying the recommendations of Dr. Voelcker into effect would shortly be made; but whatever the precise nature of these recommendations and proposals, the foundation of all must be laid in the ordinary school. If this is done, the boy who can afford to wait at school and go on to college, will carry with him from the outset the knowledge that success in agriculture is a worthy aim, which demands education as well as clerking, or schoolmastering, or scribbling, or pettifogging: the boy who cannot, will at least carry back to the fields the spirit of inquiry, the parent of progress in agriculture as in every other sphere of human activity and effort.—*Pioneer*,

HOP TEA.

A few months ago we noted that a factory had come into existence at Madestone, in Kent, where the preparation of "hop tea" was being crrried on. This product has now been placed on the market by the Hop Tea Company, of Eastcheap, London. It is sold at the rate of 2s. and 2s. 6d. per lb. The blend is made of Indian and Ceylon teas, to which is added by a special process the infusion of hops. It is claimed that some of the worst properties of the tannin are obliterated by the hoppy flavour, and a certain sedative element introduced. It cannot be denied that in the majority of Indian and Ceylon teas there is a rough, strong, taste, which, indeed, has made it one of its chief recommendations to the poorer classes. Anything which in part removes this harshness improves the tea, whilst the suspicion of hops introduced is agreeable, and likely to find favour with many. China tea, it will be understood, does not so readily lend itself to the manipulation, nor, indeed, does it stand so much in need of being softened down. The idea seems to have been a happy inspiration to remove the astringency of the tea and introduce the tonic property of the hop, Medical opinions give it that many persons who have hitherto been debarred from indulgence in tea, owing to its astringent properties, may with greater impunity embark on a trial of the hop-flavoured article.—*L. & C. Express.*

Coffee.—A small amount of Kona coffee has been imported from the Hawaiian islands, where it is grown, into San Franciso, but so far receipts have been light. An appropriation of $10,000 was made by the last legislature of Hawaii to be devoted to the encouragement of coffee raising, and the import duty on foreign coffee was raised to 6 cents per pound, an increase of 3 cents. Although coffee is grown in several of the islands comprising the Hawaii group, the Kona district on the island of Hawaii has been found the best producing section on account of most favorable climatic conditions, and it is from this section that Kona coffee comes. The bean somewhat resembles the Costa Rica coffee, but the aroma, odor and flavor are entirely different from either that or any other sort of coffee. It is said that in the islands this coffee is used almost entirely, and strangers, tourists and other visitors who taste it consider that it makes a most delicious beverage.—*American Grocer*, Nov. 12.

Mr. Horne, the Director of the Public Forests and Gardens of the Island of Mauritius, has furnished an elaborate report on the industries which it is desirable to foster in the present depressed state of the sugar trade. Mr. Horne does not doubt but that in the future, as in the past, the cultivation of the sugar-cane must be the principal occupation of the agriculturists of the island, but he points out that many other resources are open to them, and recommends, moreover, the appointment of an agricultural chemist to advise in matters connected with Sugar-cane growing and its management. Mr. Horne suggests, in addition, the extended cultivation of Coconut Palms, Cacao or Chocolate, Coffee, Tea, Dates, Oilnuts, Elais, Betelnuts, and other Palms, various cereals, starches, Indigo, Anatto, oil-seeds of various kinds, Bananas, Pineapples and other fruits, Ginger, spices, fibre plants, cotton, silk, indiarubber, Tobacco, dyewoods and a variety of other plants and their products—a list which will give some idea of the resources that are open to the cultivator in the tropics if other circumstances be propitious. Cinchona does not prosper in the island.—*Gardeners' Chronicle.*

MINING AND GEMMING IN CEYLON.

In a recent letter our London correspondent referred to the want of success which had attended the gemming operations of the past year, or past few months, in Rakwana, as telling against the credit of this Colony—and especially of local gemming and mining projects—in the City of London. The writer was too polite to say it openly, but he evidently implied that the non-success of the enterprise begun under the auspices of a Limited Company was the more remarkable in view of all that had been written in our columns in support of the industry and the many arguments in favour of investment which we had used. The inference in fact was that experience had shown the fallaciousness of our information and writings and the result threw discredit on any proposal to apply English capital to the development of gemming and mining enterprise in Ceylon. Now we beg most strenuously to object to this line of inference and argument and to protest that, up to this date, there is nothing in the operations undertaken nor the experience gained, which affects the main position we have from the first taken up, and held in reference to this branch of local industry. Our position, so far from being undermined by the work of the past year or six months, remains in fact untouched and we hold to it as strongly in the face of English capitalists as ever we did. The whole tenor of our writings has been to the effect that the Gem-digging industry of Ceylon has given employment to hundreds and thousands of natives, almost from time immemorial—that it is undeniable large numbers of sapphires, rubies and catseyes—not to speak of less valuable stones—are continuously found and sold by the gemmers to native dealers who export and sell them in India or in Europe, without any notice of by far the larger proportion of such exports being recorded in our Customs accounts. The term "precious stones" has been synonymous with the name of Lanka for all the centuries back to, and even before the Christian era, and there is no evidence that our gemming country has been by any means exhausted. On the contrary there is strong evidence to show that considerable areas of gemmiferous land remain untouched to this day. What we pleaded for then was not simply the introduction of English capital to buy up such land and to work at it after native fashion—which is all, the Gemming Companies at work (is a small way) have done; but above all the introduction of machinery and of the latest appliances so as to give a fair test to selected fields for the first time in history under the modes of working recognised as successful in the Diamond Fields of South Africa. Now this is exactly what up to date has not been done. Two Gemming Companies with limited capital have been at work—but it has been at work very much after the native fashion, with native contrivances more or less adapted, but still coming far short of the latest European appliances. The consequence has been that no proper scientific tests have been applied, and it has become notorious for native employees to make a bolt, leaving a balance of wages due to them without claiming it. Again, we have heard that all the parcels of stones and gem débris sent down from the only Rakwana Company's pit, on being shown to an expert in Colombo, has resulted in the constant enquiry—"Where have the good large stones gone to?—this is just the stuff in which they are always found; but there are no stones here save those of little value." Latterly, we understand the Company at work in the field under London auspices,

has started making a new machine to supply the need most felt in and at the gem pits; but it is not yet completed and until it is in full operation, its work cannot be judged. But even then, we question whether this machine constructed on the spot will answer its purpose so well as the complete but expensive machines constructed in England for the South African Diamond Fields. It is such machinery that we should like to see applied and tested in the Gemfields of this Colony. No test worth speaking of has yet been applied. And yet all this time, splendidly fine large stones have been brought to Colombo, exhibited and sold, or sent away privately.

We maintain, therefore, that so far from discredit being thrown on Ceylon by what has taken place in our Gem pits during the past year, we are very much in the same position as when we first called on English capitalists to establish a Syndicate or Company and set to work with proper machinery. We have not written of positive, assured success. That is a matter we left business men and capitalists to judge for themselves from the facts placed before them. All we urged was that Ceylon undoubtedly had further stores of gems, that there is a large profitable digging and export trade and that with the use of the latest and best machinery, there was every reason to believe European Companies could compete and obtain a good return on their investment.

ESTIMATED SUPPLY OF ALL TEA TO 30th JUNE 1891, AND PROBABLE STOCK ON THAT DATE.

	Indian	Ceylon	China	Java
Present Stock	39,000,000	8,000,000	44,000,000	702,000
To arrive, say	21,000,000	22,000,000	8,000,000	1,750,000
Total	60,000,000	30,000,000	52,000,000	2,452,000
Delivery for 5 months, say	45,000,000	19,000,000	33,000,000	1,500,000
Stock—30th June 1891 ...	15,000,000	11,000,000	19,000,000	952,000

Stock.

	Estimated 1891	Actual 1890	Actual 1889
Indian	15,000,000	19,317,000	21,324,000
Ceylon	11,000,000	9,670,000	8,175,000
China	19,000,000	34,274,000	31,905,000
Java	952,000	1,059,000	1.130,000
Total	45,952,000	64,320,000	62,534,000

Stenning, Inskipp & Co.,
9, Great Tower Street.

6th February 1891.

The Condition of St. Helena.—Mr. Antrobus, of the Colonial Office, who has lately been acting as Governor of St. Helena, concludes a recent report on that colony by saying that many of the civil servants have to discharge responsible duties with inadequate pay, and all the inhabitants are suffering more or less from the general depression. "It is melancholy to contemplate the present condition of an island which was once so flourishing and still has so many points to recommend it. There are still the wonderfully healthy climate neither too hot nor too cold, the beautiful scenery, the mixture of tropical and temperate vegetation, the rare indigenous plants, the clearly and marked geological structure, and the historical associations derived from the rule of the East India Company, the imprisonment and death of the great Napoleon, and the visits of Halley and Darwin and other distinguished men of science. But the ruins of well-built country houses, and the deserted cottages, which are to be seen in every direction, as well as the returns of the rapidly diminishing revenue, afford evidence of the change which has taken place in all that constitutes material prosperity; and I regret that there is at present no sign of any improvement.—London *Times*.

MINING AND GEMMING INDUSTRIES IN CEYLON.

The attention of Mr. Barrington Brown during his presence in the island, seems to have been confined to the province of Sabaragamuwa. No doubt it includes within its bounds, nearly all the recognised and well-established gemming districts, and possibly quite enough to occupy the time of the geological and mineralogical expert during a few months' stay. But it is undeniable that districts in other provinces also deserve the expert's careful examination. In the Galle and Matara divisions of the Southern Province; in the province of Uva; and in the Nuwara Eliya, Pussellawa and Maskeliya districts of the Central Province and again along the course of the Mahaoya to the North-Western Province, "gems" or "gold" are by no means unknown finds. As regards plumbago, again, the Kurunegala and Kegalla districts call for very careful attention, quite as much as the Ratnapura, Kalutara and adjacent divisions.

But even if we confine our attention altogether to Sabaragamuwa—and notably to the Ratnapura and Rakwana districts—we believe we shall find that Mr. Barrington Brown has been able to give the London Syndicate employing him, such information as amply justified his mission and most fully supported the position we have taken up for many years back in regard to our Gemming Enterprise. Of course the expert's attention was mainly directed to certain allotments of land either leased, purchased or under offer to his Syndicate and it is with reference to the value of these, and to the results of various testing operations that his report must be mainly directed. Nevertheless, he was able to enter on some general remarks descriptive of the position of the gemming country examined by him and of the geology of this part of Sabaragamuwa. Gneiss, of course, forms the chief rock encountered. It is of a bedded character and contains layers of graphic granite and hornblendic gneiss often seen gradually passing into the gneiss at the planes of contact; while in some few instances there is granular limestone. The expert alluded to the fact that as yet no precious stones have been discovered in the matrix which, in his opinion, will be found to consist of gneiss, graphic granite and granular limestone. The frequency with which garnet crystals of small size occur in the gneiss and granite—a circumstance often remarked upcountry—is alluded to. We believe the special mission of Sir Samuel Baker, the celebrated traveller, on his last visit to Ceylon, was to discover the matrix of some of our precious stones and with this purpose, it was stated at the time, with how much accuracy we cannot say, that Sir Samuel and a well-known enterprising public officer, explored hammer in hand, a good many rocky valleys high up in the Highlands of Uva, Nuwara Eliya and Sabaragamuwa, but apparently without success. Possibly Mr. Barrington Brown would be able to show them that they had not gone properly to work to find the matrix, if indeed it still exists to any extent. For, we know that by the decomposition and disintegration of the mountain rocks, the gems contained therein in crystalline form having been freed and are now to be found in gravelly deposits on hill sides bordering mountain streams—as in so many parts of Rakwana—or in alluvial layers of gravel covered and deposited in the valleys. In the former case, the natives have done a great deal of systematic work in mining and gemming, sinking "shafts" or entering "drives" in the hillsides, while in the valleys, the process is one of dredging with hoes under the river

beds, or of sinking of pits alongside. Meantime, we have the fact before us that by such simple, not to say primitive processes—almost entirely hand labour—the Sinhalese gemmors in Rakwana and Ratnapura have, from time immemorial, obtained precious stones, chiefly sapphires, catseyes and rubies while still, undoubtedly, there continue to be found many valuable stones of these descriptions.—We may have further information to give in our next.

LININGS FOR TEA BOXES.

The explanation afforded by our London Correspondent in his letter by yesterday's mail will relieve the minds of Messrs. Anderson and Maitland Kirwan of any feeling that the remarks we passed in our article headed 'Lead Linings for Tea Boxes' were of application to the patents these gentlemen severally represent.

As regards Mr. Maitland Kirwan's paper, it was of course, altogether excluded from the category of linings with which our remarks dealt. Reference was intended by that article solely to those forms of linings into the composition of which lead entered. Mr. Maitland Kirwan's material has no such character. It is what seems to be known as a "butter *paper*," and it is of this lining of which Messrs. Wilson, Smithett & Co. wrote in such complimentary terms in their Produce Circular some time back. But it must be borne in mind that an important element of the question in the relative value of linings of all descriptions is the one of cost and certainly we were not prepared for the revelation as to comparison between the paper and lead now afforded us. We had written previously under the belief that the "paper" would be the cheaper lining of the two. We are told that the rate at which 4-ounce lead can be used is about 1s 3d per chest, while Mr. Maitland Kirwan's paper is quoted—according to our London correspondent—at 1s 4½d per 100 lb. chest. For boxes holding a less quantity our correspondent could obtain no quotation. But when we refer back to the correspondence which arose in our columns in January last, we find that the difference in cost was even then fully apparent. It was stated by planters, without contradiction, that using 5-ounce lead which is now generally preferred, the cost per chest was equal to from 72 to 83 cents on the estate against 1s 4½d for Mr. Maitland Kirwan's paper *in London*, or probably a figure not far short of a rupee on the estate.

The same element—that of cost—would have excluded from consideration the lead paper known as "Clark's Patent" which Mr. T. C. Anderson has advocated. For this we have from London no quoted price; but as the 4-ounce lead with which this paper is coated is equivalent in substance to that commonly used for lead linings pure and simple, we must presume that the cost of adding that amount of lead to paper must involve a price very materially in excess of the use of a similar weight of lead when applied alone. That the combination employed under "Clark's Patent" may be most useful, and that this fact may well justify the extra cost its employment may involve, we do not deny; but this does not enter into the scope of our present contention. It will, of course, be acknowledged that this question of relative cost is one of primary importance to our planters. What we want to obtain is a lining which, while equally efficacious in preserving tea as is a simple lead lining, shall be superior to it in economical result. This, according to our present information is scarcely obtained by either Clark's lead paper or Mr. Maitland Kirwan's "butter" paper. Both o them, no doubt, are exceedingly efficient and reliable, but they are both more costly than the material in ordinary present use.

As for the tin-foil paper, which we are told the remarks formerly made were more specially intended to apply, there seems little cause to doubt that it does not afford a reliable lining for tea boxes even though its cost may be below that of our present staple material. It would be poor economy to save a few pence on every chest of tea packed while having no assurance that its contents would reach the London market uninjured. As yet therefore—price for price being taken into account—it must, we fear, be admitted that we are without a satisfactory substitute for lead. Lead has been proved by long experience to be a very efficient material for packing tea in chests. We are reminded, however, that Messrs. Wilson, Smithett & Co. would gladly see something substituted for it. For in the first place, even the best of sheet lead will only bear a certain amount of handling. The packets, it is asserted, which are retailed in lead, deteriorate if they are subjected to a long course of rough handling. Much "pinching"—to use the term which seems to indicate the course of such rough handling—will, if long continued, crack the lead, and the contents of such packets will deteriorate greatly. But Messrs. Wilson, Smithett & Co. point out a second reason why some alternative to lead would be welcomed. This is the fact that, should the wood of the chest be not properly seasoned, and consequently exude any sap, the result is to produce "acetate of lead," which not only destroys the lining but most seriously affects the tea enclosed. It is to such a cause that the "cheesy" smell and flavour of a large quantity of Ceylon and Indian teas returned upon the Brokers' hands, has been attributed. The "butter" paper of Mr. Maitland Kirwan, if used, might obviate all chance of this particular cause of deterioration. Would it not then be possible for this material to be reduced in price? Messrs. Wilson, Smithett & Co. have borne evidence to the protection it has afforded to teas sent home in it, and the objections raised to lead now referred to, do not attend its use. If a longer experience of this "paper" were to justify Messrs. Wilson and Smithett's conclusions, we have little doubt that a reduction in its cost would ensure for it a wide adoption by our planters. Meantime does not the course of this discussion in our columns and the many points which are still necessarily left open questions, show the need, in the planting interest, of that "P. A. Sub-Committee" to enquire into and test new inventions and economical processes, which we suggested some time ago and which suggestion has been supported in our columns by not a few planters. If Mr. Giles Walker distinguished his year of office, by the establishment of such a Sub-Committee, we think he would do a good thing in the interests of the planting community.

ANTIQUE DIAMOND DRILLS.—Mr. Flinders Petrie has originated the theory that the ancient Egyptians were familiar with the diamond drilling device. In his "Pyramids and Temples of Gizeh" illustrations are given of samples of work which apparently show the use of jewel points in drilling and sawing. Various samples of this work are in his possession. He cites six examples in the Bulak Museum and at Gizeh. In a temple at Gizeh there is found in one of the lintels of a door a drill hole with the core still sticking in it. A base of a tube drill hole is also found between the feet of a statue of Chefren now preserved in the Bulak Museum. —*Indian Engineer.*

CINCHONA IN THE DUTCH MARKET.

Amsterdam, February 6th.

The Amsterdam auctions on February 26th will consist of 2,941 bales, 156 cases (about 239 tons) divided as follows:—Java bark: From Government plantations 323 bales, 37 cases, about 28·5 tons; from private plantations 2,618 bales, 116 cases, about 210·5 tons. African cinchona bark: 3 cases, about 4·29 cwt. Druggists' bark: Succirubra quills, 132 cases; broken quills and chips 68 bales; root 23 bales; C. Schuhkrafft quills 6 cases; Lancifolia quills 5 cases; broken quills and chips 11 bales. Manufacturing bark: Ledgeriana quills 10 cases; broken quills and chips 2,165 bales; root 408 bales; Hybrids broken quills and chips, 200 bales; root 56 bales; Officinalis broken quills 10 bales. Total 2,941 bales, 153 cases.—*Chemist and Druggist.*

NOTES ON PRODUCE.

COFFEE AND CHICORY.—A Liverpool firm have been accustomed to sell the so-called "French coffee" in pound canisters, price one shilling; and, as they took the precaution to affix a label warning the purchaser that he was buying a mixture of chicory and coffee, they probably considered themselves free from either legal or moral offence. As their legal representative virtually put it: "Some people prefer chicory; we sell the mixture; they know what they are buying, and there is an end of the matter." The Liverpool magistrates, however, reason differently, and insist that even under these circumstances "fully one-third, or probably much more," chicory is excessive. Hence they have imposed a fine, but the Liverpool firm have determined to appeal.—*H. and C. Mail.*

TEA IMPORTS, DUTIES AND PRICES IN AMERICA.

Tea importers and dealers are not a little interested in the bill before the House of Representatives to re-establish the former discriminating duty on tea shipped from ports west of the Cape of Good Hope. Prior to 1883 the following provision stood in the tariff law: "There shall be levied, collected and paid on all goods, wares and merchandise of the growth or produce of the countries east of the Cape of Good Hope, except wool, raw cotton and raw silk, as reeled from the cocoon, or not further advanced than tram, thrown or organzie, when imported from places west of the Cape of Good Hope, a duty of 10 per cent. ad valorem in addition to the duties imposed on any such article when imported directly from the place or places of their growth or production." This discrimination in favour of direct impo ts came down from the early days of the Union, having been established originally for the purpose of encouraging the carrying trade with the East Indies and China. The opposition to it has been based in part at least upon the belief, which the statistics confirm, that it was in reality special legislation against imports from London. At the same time rival commercial interests have come to be involved in the matter.

The imports of tea into the United States in 1889 amounted to 79,575,984 pounds, of which 40,751,789 pounds came from China and 33,303,437 pounds from Japan, 260 927 pounds from the British East Indies and 203,825 pounds from Hong Kong. This leaves but 5,056,006 pounds from ports other than the places of production, and of this quantity England furnished 4,673,864 pounds. The remaining 352,142 pounds is the only evidence which can be furnished that the law would have a general meaning and not a specific one. Under free entry the increase of indirect imports has been very small, but such imports being forced upon the market at critical times have had considerable influence, it is claimed, in breaking values.

The disturbing influences in the tea market have been many, and it is therefore difficult to specify any principal cause as having affected declines or advances in values. The recent advance in silver has naturally disturbed prices in the East, silver being the sole circulating medium in China. The financial stringency in this country and England has likewise compelled many holders of tea to liquidate, though it is to be said that the fact that failures among tea merchants have been so few is a forcible illustration of the strength of the market. These financial troubles have caused a weakening in prices and checked the advance started through the rise in silver.

The stock of tea in this country is at present very heavy, and prices are in consequence lower here than in England. Hence London merchants are now buying tea in New York. The promoters of the new legislative agitation hope by means of it to buoy up prices and prevent a further decline. But many dealers have been free to predict that no such legislation will be passed by the present Congress. It is claimed by the advocates of the measure that under free entry London merchants are able to place here large quantities of tea whenever the market shows a tendency to advance. London merchants derive an advantage over our importers through the difference in cost of transportation. Freight rates are lower between China and London than between China and the United States. The former duty, of course, benefited to some extent steamship lines running between tea centres in China and Japan and the ports along our Pacific coast. Canada formerly bought the larger part of her supply from the United States, but since 1883 the tendency to buy of London merchants has increased, while the trade with the United States has fallen off. Our imports from London, which comprise about 5 per cent. of the total annual receipts, are mostly inferior teas. To prevent a further weakening in values by forcing large quantities of tea upon the American market shippers are now holding 70,000 half-chests of Formosa tea in Amoy.

The annual imports of tea between 1880 and 1889, inclusive, were as follows:—

	$		$
1880 ...	19,782,631	1885 ...	14,047,583
1881 ...	21,004,813	1886 ...	16,020,383
1882 ...	19,392,102	1887 ...	16,771,802
1883 ...	17,302,849	1888 ...	13,360,685
1884 ...	13,636,053	1889 ...	12,654,640 *

Secretary Rusk thus speaks in his annual report of the investigations of his department in regard to the adulteration of beverages: "These investigations show that the adulteration of such articles is not very extensive, and, except in the case of tea, is easily distinguishable. The most frequent one is the introduction of substances to give additional weight, such substances as will attach themselves readily to the leaves, and yet not be easily distinguished by the eye. These substances are mostly of a harmless character, although some of them have been found to be deleterious."

Importers and dealers declare that no foreign substances are added, and the use of the term "adulteration" is misleading. When the leaves of the tea plant become mature no more nutriment is furnished them by the plant except what is just sufficient to maintain life, the sap being supplied to the younger leaves and buds. The older the leaf the less valuable it is, as it becomes hard and woody, and thus loses its nutritious properties. These leaves are frequently worked in with more valuable products, but they are not adulterants under the common meaning of that term. The chemical solutions to which the leaves are subjected, it is claimed, are to give them a uniform color and not to add to their weight. An expert can easily detect the presence of the old leaves. The yield is so abundant that the necessity of adulterating tea is thought to be very small. The production is constant, and not, as in the case of vegetables and cereals, subject to the seasons.—*Bradstreet's.* [True of Ceylon, but not of India and China, which have a winters. —ED. *T. A.*]

* The figure for 1890 will be over 14 millions of dollars.—ED. *T. A.*

LINING OF TEA CHESTS: LEAD *VS.* PAPER, &c.

Every effort has been made by me this week to assure myself respecting the fullness of the grounds upon which the criticisms passed by me in a former letter of mine on the substitutes proposed for the lead lining of tea chests were based, and for the result to which—as set out in your article of comment on the subject—you, with perfect justice, held me to be responsible. I sought in the first place an interview with two old Ceylon planters now at home, both of them men of great local experience in Ceylon and both very largely engaged in dealing with your teas in London. I can best communicate to you their views by giving you as nearly as possible the words of the elder and more experienced of my two interviewors, both of whom —were it authorized to me to mention their names —you would acknowledge to be among the highest possible authorities on such a subject. The senior of these remarked to me:—"I have read all that you and the *Oserver* wrote on this subject of lining tea chests, and I may express my fullest concurrence in anything that has been written by you both. Stick to your guns: don't you be driven from the position taken up by you. The particular lining you saw—and which we have all seen—penetrated by innumerable small holes is what is known as a tinfoil paper. None of us will ever use it again, despite the fact that its first cost is much below the cost of 4 ounce lead. I see Mr. Maitland Kirwan complains of the remarks made by the *Observer*. He certainly has no right to do so, for his lining is not a lead paper at all, and your remarks were confined to linings of that character. What Mr. Maitland Kirwan proposes is the 'butter' paper formerly shown you. We have nothing whatever to say against the use of this material save that its cost is higher than that of pure lead, which I use at about 1s 3d the chest, and this fact tells naturally against it, as it does not give better results than lead. Then as to Mr. Anderson's lead paper, that known as Clark's patent, the *Observer* should surely have recollected letters written to it by some planter who has used it pointing out that the cost of it was very greatly in excess of simple lead. This must naturally follow from the fact that Clark's patent adds to the cost of the 4-ounce lead that of backing it with paper. It is no doubt capital stuff, but the cost excludes it from the category of linings respecting which you wrote, as these included only those from the use of which an absolute economy as compared with that of lead was to be anticipated. What we want is a *cheap* substitute for lead. The last answers every needful purpose, and we are not likely to adopt any alternative material in lieu of it which will involve extra cost. In my opinion Messrs. Anderson and Maitland Kirwan, when writing in complaint of the *Observer* article, should not have left the higher price of their materials without mention. The fact that they did so did not enable general readers to fully understand the case."

Immediately after terminating the interview of which the results have above been given, I went and saw both Mr. Wilson and Mr. Smithett on the subject. Those gentlemen told me they had read all you had published relative to it. They kindly looked up their own circular in which they had praised Mr. Maitland Kirwan's lining, and they said that, although their experience of it had fully justified what they had written, they know nothing as to the cost of it. The teas consigned to them and packed in this butter paper had arrived in admirable condition, and they should be very pleased if fuller experience should justify the supersession by it of lead. "For," Mr. Smithett remarked, "although we do not believe that the contact of lead with tea is in any appreciable degree injurious, there is no doubt that if unseasoned wood has been used for making the boxes a lead lining is likely to be a very dangerous one. When we lately complained of the 'cheesy' smell and flavour of a quantity of Ceylon teas received by us, we had them submitted to analysis, and it was found that they were strongly impregnated with acetate of lead. This was the result to the action of the acid of the wood on the lining, and it had eaten away the latter and had fouled the tea to such an extent that after sale we had a very large quantity of the chests returned to us, and a very heavy loss had to be borne when finally obtaining a purchaser for it. What we want, therefore, is to see lead superseded altogether. As long as it is liable to action by acid from the wood the danger mentioned will always be present."

After leaving Messrs. Wilson and Smithett I proceeded to call on Mr. Maitland Kirwan. Unfortunately that gentleman was out, but to my request in his office for a quotation of the price of the "butter" paper linings it was given me as 1s 4½d. for a 100 lb. chest. On my asking the price for half-chests it was replied to me that they had no quotation for the lesser sizes. This information was confirmatory of what had been mentioned to me in the interview first recorded. You will see that the question resolves itself finally into this, viz. that there may be efficient substitutes for lead, but that none of them meet what my letter stated to be desired *i. e.* a substitute for it which should be less costly. When my letter to you was written neither Clark's patent nor Mr. Maitland Kirwan's paper were in my mind, and only the second had ever been under my own observation.

UNITED PLANTERS' COMPANY OF CEYLON LIMITED: £250,000 CAPITAL.

There has been a "mighty big thing" in connexion with Ceylon started this week, and this has been done so quietly that even Mr. Leake, on my mentioning it to him this week, told me he had not heard even a whisper about it before my telling him of it. The following referring to this new enterprise is extracted from the *Investors' Guardian* of Saturday last:—

UNITED PLANTERS' COMPANY OF CEYLON, LIMITED.

This company was registered on the 3rd instant with a capital of £250,000, in £10 shares, to acquire properties in Ceylon, and to carry on the business of tea and coffee-planters generally. The subscribers are:—

	Shares.
*H. Brooks, St. Peter's-chambers, Cornhill, merchant	1
Hy. Brooks, St. Peter's-chambers, Cornhill, mechant	1
*H. T. Brooks, Redlands, Upper Long Ditton, Surrey, merchant	1
*J. M. Boustead, Westfield-lodge, Surbiton, merchant	1
A. O. Shroft, 29, Groombridge-road, South Hackney, clerk	1
I. D. Tarr, 7, Liston-road, Clapham, S. W.	1
P. Pears, 18, Leigham-lane, Tulse-hill, S. W., clerk	1

The number of directors is not to be less than 3, nor more than 7; the first being the subscribers denoted by an asterisk; qualification, £500 in stock or shares; remuneration to be determined by general meeting. Solicitors, Messrs. Parker, Garrott and Parker, St. Michael's Rectory, Cornhill, E. C.

Calling the other day at the office of the solicitors to the Company, it was told me that no

prospectus whatever had been printed, that the association was in fact quite of a private character, and that details could not be communicated to me. It was not yet decided whether any public subscription would be sought. If it was eventually decided to do this, it would only be for the sake of obtaining a quotation on the Stock Exchange, But although my inquiries in this quarter had so little of success, it reached me from another that the venture was mainly in the hands of Messrs. Brooks & Bousfield, and the properties with which the Company will deal were mentioned to me; but I was requested not to publish either the names of these or of their proprietors, as to do so, it was thought, might be harmful and might give offence. Most likely the names published in association with the registration of the Company will afford you the clue which it is forbidden to me to give you.—*London Cor.*

TEA INFUSION.

(*From a Correspondent.*)

I spent some minutes testing the boiling of water. In these busy times no one could afford to wait long enough for the Japanese *third* stage referred to by Sir Edwin Arnold. Still for one's own edification, enlightenment, and it may be gratification, I would suggest the testing of this Japanese style of making tea with honorable "old hot water." There may be something in it—who knows? It is a fact that the "G. O. M." does not care to drink tea *unless it is prepared for him by Mrs. W. E. G.*, and yet the old man is very partial to tea. Can it be that Mrs. Gladstone has got some secret, or does she adopt the Jap's plan? If so she should be asked to reveal it *pro bono publico*. I have no doubt she would if she were only asked. Then why not ask her in Ceylon's name, sending her 100 copies of the tea Leaflets? *We all* know that we prefer tea made by some few people to all the tea we are offered by others. So there is *an art* in the process, and Mrs. G. I have no doubt would readily grant us every assistance. It is worth trying for.

The Tea Leaflet published at your office, I fancy, will have helped to check the baneful practices of taking a second brew and allowing the tea to draw more than 5 minutes. If so it will have done some good and helped on consumption in the U. K. and elsewhere, although the number of consumers may not have very considerably increased. But in the long run deliciously made tea MUST increase the number of consumers very considerably throughout the world. Attention all round seems now being given to tea—see page 28 top para. in the *World*, 28th Jan. 1891. "Over the Tea Cups" is Dr. Holmes's new work, and it ought to be good coming from the author of the "Autocrat of the Breakfast Table"; but I suppose it will have very little to say about tea *itself*?

Considering that Sir Edwin Arnold took the English belt as a tea drinker while he was in Japan lately by drinking about 80 *Japanese* cups of tea daily, I think the Ceylon Tea Fund made a mistake in not presenting him with a small box of Ceylon's choicest leaf when he passed through Colombo a week or two ago. But Ceylon tea is rushing ahead so steadily in the world's favor just now that it exemplifies the old saying "good wine requires no bush."

You should obtain from Calcutta one or two electroplated *Bengal Tea Sulkies.* They cost but very little and beat the egg-shaped tea leaf dippers *hollow*. By the aid of these sulkies everyone can make tea to her or his liking and without trouble. The lower portion is of fine gauze wire and far better than china ware.

All you want then is one of Messrs. Walker's American kettles big enough for tea making purposes, of the *finest* quality of thin sheet iron,—the water boils *rapidly*,—oval-shaped lid at *back* and handle in *front* there is no danger of scalding one's hands by the steam issuing from the lid.

PLANTING PRODUCTS:

COFFEE—CACAO—CINCHONA.

(*From the Annual Report of the Badulla Planters' Association, held 14th Feb. 1891.*)

Coffee.—Your Committee congratulate you upon the improved appearance of coffee in the districts. Seasons have been more favourable for this cultivation of late, crops are good and prices for the old staple are all that can be desired.

Tea.—Tea now fast becoming our leading product is making most satisfactory progress in all the districts comprising your Association: at the present time more than 10,000 acres are under this cultivation and a large area is being planted up yearly. The exports of tea from Badulla, Madulsima, Hewa Eliya and Monaragala districts for 1891 are estimated at 2,000,000 lb. This is a good yield considering that so large a proportion of the acreage is only recently planted and is not yet in bearing. Tea cultivation in the Badulla district promises to be exceedingly remunerative in the future, and your Committee congratulate you upon this.

Cinchona.—This product, your Committee regret to say remains in the dull and depressed condition reported last year. No improvement in prices has taken place. The exports from the Badulla and Madulsima districts for 1891 will be about 2,000,000 lb., a lower total than for some years past. Statistics for cinchona bark are more favourable, but the depressed market, your Committee believe, is owing in a great measure to the fear of increased supplies from Java. No great fluctuations in prices have occurred during the past year, the unit ranging from 1½d to 1⅞d. Your Committee are, however, hopeful that with a steady falling off in exports from Ceylon some improvement in prices will take place during 1891.

Cacao.—Your Committee are pleased to report the continued successful cultivation of cacao both in Monaragala and in other parts of the district. The past season has been very favourable, and there has been very little helopeltis: in fact where shade has been used from the first there is none to be seen. As the trees get older the blossoms set more favourably and crop increases. Prospects for the coming year are very good and with the price at 115s per cwt. there is no doubt that cacao is a product second to none. The acreage under this cultivation is from five to six hundred acres.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Feb. 12th.

CINCHONA.—At Tuesday's auctions a very moderate quantity of bark was offered, the catalogues comprising only:—

	Packages		Packages	
Ceylon cinchona	887	of which	825	were sold
East Indian cinchona..	1,440	do	1,183	do
Java cinchona	39	do	32	do
South American cinchona	582	do	39	do
Total	2,928	do	2,079	do

The assortment of bark was rather poor, especially that of Ceylon cinchona, but Succirubras from India were well represented, and included one parcel of not less than 20 tons weight from the Wentworth plantation. It was generally expected that prices would rule lower, quinine having been greatly depressed during the week, and it was said that several holders of Indian and Ceylon bark had given instructions to sell at any price. The prices realised were somewhat irregular, but decidedly easier all round, and the unit cannot be placed at a higher average than 1½d per lb.

The following are the quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick factory	157,493
Agents for the Mannheim and Amsterdam works	142,294
Messrs. Howards & Sons	43,015
Agents for the French, American, &c., works	30,682
Agents for the Auerbach factory	27,484
Agents for the Frankfort o/M. and Stuttgart works	22,905
Mr. Thomas Whiffen	2,440
Sundry druggists and spectators	39,780
Total quantity sold ...	466,093
Bought in or withdrawn	148,673
Total quantity sold ...	614,766

QUININE has attracted a considerable amount of attention this week, and the total transactions reported since last Friday amount to about 320,000 oz., of which 130,000 oz. changed hands today. On Monday the drop in price reached its lowest depth, in a small sale of German bulk quinine on the spot, at 10d per oz., a price which beats the record. It is true that the authenticity of this sale is doubted in many quarters, but there is no question that at one moment the drug was freely offering at 10¼d per oz. Several buyers then entered the market, which thereupon took a turn for the better, and kept on improving until today, when 10⅜d per oz was freely paid for delivery up to May. The price of 11d per oz is now again generally asked. Howard's brand has been reduced to 1s 3½d per oz for bulk, and 1s 5½d for vials.

CINNAMON.—A sale of 100 bales is reported to have been made recently at 6⅛d per lb., c.i.f. London terms, for February-April shipment, usual assortment.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F. L. S., F. G. S. &c.,
EDITOR OF "SCIENCE GOSSIP."

I notice in the last number of *The Australasian* to hand that Mr. John M'Lellan, of Dimboola, has ingeniously turned the tables on the Locusts by planting patches of larkspur among his crops. These voracious insects devour "every green thing," but they could not digest larkspur leaves, so they died. The larkspur is a member of the most poisonous and otherwise objectionable order of plants in the world, the ranunculaceæ or buttercup family. The seeds of the larkspur were formerly ground to powder and used as a vermin killer. So intense is the poison that it is and must be used homœopathically. I mention this because the planting of larkspur indiscriminately may do more harm than the locusts. There is one plant among the vast number composing the natural order leguminosæ, which can lay claim to being a fodder plant and a poisonous plant at the same time. Let some young farmer plant patches of lupins instead of larkspurs. I venture to say they will be equally fatal to locusts, and they have the advantage of being a good sheep fodder, capable of growing on the lightest and hungriest of soils, where few or no other plants could grow.

It is as well to note a fact recently discovered, that artificial stone cements abounding in magnesia have a tendency to expand slowly after the concrete has set in which they have been used. This is a matter that builders and architects should see to, otheriwse their completed work will do them anything but credit.—*Australasian.*

"AN INDIAN CINCHONA PLANTATION" forms the subject of four sketches (taken from photographs) in the *Chemist and Druggist* of 31st Jan., with descriptive letterpress. The plantation is one on the Kannan Dovan hills in Travancore, the first sketch giving a general view of the country; while the second shows a clearing in the forest, with buildings; the third women picking tea growing among the cinchona; and the fourth the drying-house and tea factory.

ACTION OF ALUM ON MICROBES IN PORTABLE WATER.—In the *Chemical News* for October, page 177, there is an interesting reference to the use of alum for the removal of organic matter in suspension and in solution in drinking water. It is well known tha when alum is added to ordinary water it is decomposed, its sulphuric acid combining with the lime and its alumina being thrown down in combination with the organic substances which are present. Along with this percipitate and entangled with it the microbes are also mostly precipitated.

The *Chemical News* states that since this method has been adopted by the French troops in Tonquin they have enjoyed a nearly complete exemption from dysentery. This method was employed in preference to boiling the suspected water, the facilities for doing which were not always at hand.—*Engineering and Building Record.*

MAURITIUS.

(From the *Merchants and Planters Gazette.*)
PORT LOUIS, FEB. 10TH.

THE WEATHER AND THE CROPS.—We have been threatened by two cyclones within the space of twelve days. They have however fortunately both passed at a sufficiently long distance from the island, and have resulted only in refreshing rain of which the coming crops were in much need after the long drought. The fall in the barometer was considerable during the nights of the 5th and 6th instant, but we escaped, notwithstanding some hours of anxiety. We have unfortunately to expect these terrible visitors until the end of next month.

VANILLA.—Transactions have been very limited since the last four weeks. A few small lots of good quality were sold at R15 per kilo. Vanillons at R8 to R9, according to length and quality. We entirely confirm our last valuations as regards the outturn of the crop which will not exceed 14,000 kilos.

ALOE FIBRE.—The market is dull. We have to record the sale of a few small lots fine quality at R225 to R240 per ton. Holders prefer to ship for their account rather than to sell off at the above prices. The following quotations are nominal:—

1st quality	... ...	R250 per ton
2nd „	... ...	R175 „

MINING AND GEMMING IN CEYLON.—We learn that the Syndicate which employed Mr. Barrington Brown and whose local agent is Mr. E. G. Harding, has sent out a mining superintendent in Mr. Bettison who has had large and varied experience, but was never in Ceylon before. Unfortunately, the machinery which was to accompany him in the S. S. "Rewa" was shut out at the last moment owing to dock difficulties, but this will follow in due course. Mr. Bettison starts off tomorrow in company with Mr. Chas. Byrde and perhaps Mr. Harding, to inspect plumbago mines, inland from Bentota in the Pasdun Korale. Of course, his operations will be merely preliminary to see how and where improved pumping and other machinery can be applied to plumbago mines.

ROYAL BOTANIC GARDENS.—We have to acknowledge the receipt from Government of the Report for 1890 of Dr. H. Trimen, F.R.S., Director. Dr. Trimen is usually first in the field and as his Report is one of the most interesting and useful, it is well to have it early. Pending adequate notice and very copious extracts respecting the five Gardens as well as Economic Products, we content ourselves today with three small quotations. First as to the drought in the Anuradhapura Garden:—

It is indeed remarkable how comparatively well some trees stand the drought which would have been expected to fail to do so. Thus the breadfruit ripened last year, and a good plantains of the *kolikuttu* variety were abundant.

Next, as regards growth at the Badulla Garden:—

Some of the young trees of *Cedrela odorata* are already 2 feet in girth at the base and 16½ in. at a yard from the ground. Our chief trouble now is the vast abundiance of white ants, and these are specially destructive in the nurseries.

And finally a paragraph bearing on the discussion referred to by Mr. Barber in his letter today:—

No doubt crossing goes on freely in cacao plantations even between the two main races, and it is well-known here that seed from a single tree gives a very varied progeny; but a very curious remark has been recently made to me by a large grower, who has great opportunities for observation, that the "Forastero" varieties, which he chiefly cultivates, appear to be gradually changing their characters and becoming more like the "Old Ceylon Red," the seeds losing their dark colour on section and becoming pale or nearly white. It will be very interesting to observe whether these observations are confirmed by longer experience.

CASTOR AND COCONUT CAKE AS MANURE.

Discussing the communication that appeared some time back in your columns, as to the relative value of Castor and Coconut cakes as fertilising agents, I see it asserted that the latter is possessed of some constituents that render it as valuable as castor cake. If such be the case, surely an Agriculturist of Mr. Hughes' standing would not have overlooked them, and he would not have recorded, what must be regarded as his deliberate opinion, that taking the white castor cake he analysed as a standard of comparison with 100 as its equivalent, Coconut poonac scores only 53.* Unfortunately, the sample cannot be regarded as a fair one, for the stuff was imported and was also damp. Of course, nitrogen is not the only food plants require, but isn't it the chief food of plants? According to my way of thinking, coconut poonac must be less than half the price of castor cake to make it preferable to the latter as a fertiliser, and to permit of the application of twice the quantity of castor cake per acre.

I saw an extract not long ago in one of the local papers that for fruit-bearing trees there was no treatment that answered better than mulching. I am sorry I cannot lay my hand on the extract to find out whose opinion that was. I thought it would have found a place in the *Tropical Agriculturist* for the current month, but it has not. The value of mulching in agriculture is undoubted, although when in the palmy days of the coffee enterprise some estates were mulched with mana grass, planters were found to condemn the system. Their objection was that the operation drew the roots—the rootlets rather—to the surface, and that the later state of the trees become worse than the first. The same objection was urged by those who have the management of the Horrekelle Estate to the use of fibre dust as a mulching. Though these objections have some force, yet they are not of sufficient weight to counterbalance the advantages of mulching. These are manifold. 1. It prevents the caking of the soil. 2. Keeps it open and porous and permits of its being aerated and cool. 4. Prevents too rapid evaporation, and affords moisture to the roots. Though these are not the only advantages of mulching, yet they are of sufficient importance to remove doubts as to its value. It is well known that roots can take up plant food only by absorption. If there be no moisture in the soil, trees must as a necessity starve. All the food in the soil is not present in a soluble form, indeed only an infinitesimal portion of it is in such a state. The preparation of foods goes on continually by the aid of certain agencies, not the least of which are water and carbonic acid and oxygen. Now, if by the aid of mulching moisture is conserved in the soil, and it is kept open and allows the free passage through it of the oxygen and carbonic acid of the air, not to speak of the large quantities of the latter which will be generated by the decomposition of the mulch, I think it follows that mulching is of great advantage in Agriculture. The decay of the mulch, and in fact of all vegetable matter, forms humus. This is an absorbent, and in its dry state takes up ammonia from the atmosphere and gives it to the soil during rains.

In coconut cultivation we have ready at hand material for mulching round the roots of the trees. Before mulching I think it best for the soil to be broken up round the stem as deep as possible, from about four feet from it to the distance of about 8 or 10 feet. The application of manure before the operation will be a decided advantage. After this the branches as they fall and the weeds as they grow can be applied over the broken ground and the soil never disturbed again. Subsequent manurings can take place one year between the rows of trees, and next in the rows. By this means the shock to the tree by the bereaking of the roots will be minimised.

* Would that proportion stand in reference to all kinds of fruit trees? If the analysis was not made with regard to Coconuts, it would be an advantage to ascertain the percentage of the constituents in Castor and Poonac which the palm chiefly affects.—ED. "Ex."

Speaking of the breaking of roots reminds me that Mr. John Ferguson, in his lengthy notes of a trip through the Eastern Province, speaks of the desolate appearance of the coconut plantations there owing to the long continued drought. In one instance he mentions that the effects of the drought had been aggravated by breaking the roots of the trees with an elephant plough. Ponder over that ye prophets who recommend ploughings "annual and oftener" of coconut, and ye their disciples. Mind, I do not say "never break up the soil of your coconut plantation," but as experience and observation both point to the operation being attended by severe shock to the trees, "break", I say, as few roots as you possibly can at a time." The same writer observes that, unlike fruit trees in England, coconut trees seem to resent root pruning. Ploughings, "annual and oftener," represent a very severe form of root pruning and of a quite unscientific description. Besides, it must not be forgotten that there is a vast climatic difference between Europe and the Tropics. There, heavy root and branch pruning must be resorted to check growth, and to give a sufficient shock to the tree to induce it to bear fruit. Here, nature does that in the drought we have, and there is never much necessity to supplement her operations. I very much think that one of the reasons for leaf disease taking such a firm hold of our coffee, was the enfeebled condition of the bushes owing to heavy branch and root prunings—manuring having involved the latter operation.

The warning, if not rebuke, of the veteran Editor of the morning sheet to those whose zeal outruns their discretion in recommending the cultivation of myriad products, is well timed. It comes with singular force from him who, when in the vigour of manhood, was closely identified with our great planting industry and took a prominent personal part in the trial cultivation of many minor products. Because a product does well when cultivated over a small area and receives special and unremitting attention, it by no means follows that it will do equally well over large areas. Indian corn with us is essentially a garden cultivation, and does well on the garden plots that surround the cooly lines of up-country plantations, as also on the garden plots of the neighbouring villagers. One knows how well these plots are manured naturally and artificially, and how well cultivated they are. Agriculture, except perhaps in the North of the Island, has not with us reached such a stage as to cause us to expect the same careful treatment of the soil over even moderately large areas as in garden cultivation. In times gone by, and perhaps even now, large quantities of Indian corn were grown in the now historic Walapane villages, and found a ready sale on Estates for feeding horses and poultry. The surplus found its way on the heads of villagers to Nuwara Eliya, a distance of about 15 or 20 miles, and over a road infested with dangerous rogue buffaloes and elephants. The markets were the same for all garden produce, including plantains. This, mind you, by villagers who in recent years have been credited with preferring starvation and death to honest labour.

Like the sea-serpent and the monster gooseberry, certain products are discussed here periodically with all the force and freshness of novel ideas. One of these is the Sunflower. At one time its malaria-absorbing properties are trumpeted forth, and the possibilities of reclaiming malaria-laden regions are discussed. At another, the wonderful properties of its seed-fattening poultry and making them lay. At another, the oil-yielding property of its seed, making it an ornamental, useful and valuable economic product. At the present time, when fuel is jocosely said to be a burning question, the value of the stalks for fuel and its extensive cultivation for this purpose is spoken of. Was there not published in the *Examiner* the results of a rather extensive cultivation of this product by the enterprising Mr. de Soysa at Hanguranketa, a few years back? I cannot find this in the *Tropical Agriculturist*. Sunflower as fuel was discussed years ago. Its use as such, and its being equal to coal as a heat-producing agency, were discovered, like all other great discoveries, in America.—B.—Local "Examiner."

FRUIT GROWING IN INDIA.

A short time ago we drew attention in these columns to the importance, generally, of encouraging the cultivation of fruit trees in this country as an industry, and on the present occasion we propose to deal with it more specifically by entering in greater detail into how it should be done, and the varieties most suitable for a commencement. In the forefront of all Indian fruit trees we will place the Mango; not only on account of its being most generally grown all over the country, but also because it is the one fruit tree in which the Natives of India really take an interest. Those who have not had opportunities of tasting good mangoes, have a notion that this fruit is like so much tow and turpentine. A more erroneous idea never was entertained; it would be as accurate to conclude that the characteristics of the crab apple are those that distinguish all the varieties of the apple in England. Even the fibrous uncultivated mango very often has a most exquisite flavour, but the only way to enjoy it is to do as the Native does and suck it! There are mangoes of all shapes, sizes, colours and varieties and they flourish all over India. Some years ago a scheme was submitted to the Government of the N.-W. Provinces for the establishment of a Mango Society, with the object of studying and tabulating the varieties of this fine fruit; of making coloured drawings of them; of forming an extensive orchard where all the known choice descriptions might be collected, propagated and distributed; and for learning by experiments the best ways of cultivating and improving them from seed. The proposal unfortunately did not meet with the approval of Government, and fell into abeyance. Attempts were then made amongst Native gentlemen to promote the idea, but met with no support. The following instance illustrates the light in which some minds regard philanthropy. A certain collector of choice varieties possessed a rare specimen, for a few grafts of which he was asked for planting in a public garden. His reply was that the could not think of parting with cuttings of his unique specimen as it would at once be propagated and diffused and so become common. His one idea was to jealously guard what he had, instead of permitting his fellow men to participate in its production.

In the "Flora of British India" about 20 distinct species of *mangifera* are described, and it is stated that there are about 30 in all. There is, therefore, a fine field for Horticultural Societies in India for their further development. Bengal, Bombay, Madras and the N.-W. Provinces can produce quite 50 different varieties, all well worth sending to Europe, in place of the wretched specimens from the West Indies now to be found in the London shops. In Madras we have the celebrated Salem and Bangalore Mangoes; in Bombay the "Alphonso," the "Pairee" and the "Fernandina" are grown; whilst in Benares the "Singra," and in Fattegarh the "Takari," are of delicious flavour. In India mangoes are always plucked when still unripe, and allowed to mature in straw. This habit might easily be taken advantage of for export, and large quantities could be transported to Europe in specially prepared cool chambers. Since Australia can successfully send fresh fruits to England, there is no reason why Bombay, which is but half the distance, should not do the same; and the trade once started would certainly prove remunerative enough to cause a large extension of operations to America and Australia. There is, moreover, room for an extensive trade between Northern India and Bombay. A comparison of prices, shows that whilst in the latter place good mangoes at the commencement of the season sell at R16 per dozen and at the height of the season at R8 or 9 per 100, the choicest mangoes of the N.-W. Provinces may be bought at R4 per hundred. The rail journey occupies under 40 hours, and these facts only require to be known to create a trade. It is always difficult to initiate anything in India without Government support, but if Government would but see fit to move in the matter, say, by inaugurating a show to be held in Bombay, there is little doubt but that the idea would rapidly develop. Natives will not be backward in taking up new methods of cultivation if such have been proved to them, by means of experiments carried out in Government gardens, to be profitable. At present their ways of cultivation are crude and barbarous. For instance, the leaves that fall in the autumn and winter from trees in orchards are universally swept away and used as fuel. Now in these leaves there are all the ingredients for the nourishment of the tree, whilst they also prevent the moisture from evaporating too rapidly from the ground. Their own fallen leaves go on nourishing the trees for centuries, and an experiment in Lucknow showed how an almost arid bit of ground was turned into all but a tropical garden almost entirely by the use of surface leafage and irrigation. The leaves were first brought from outside and afterwards the trees themselves provided this surface manure, which kept on increasing every year. Another point in which natives are very careless, is irrigation. They almost invariably give the ground too much of it; probably going on the principle that as they pay no more for a lot they may as well have it. Without proper drainage the soil gets waterlogged and the trees become miserable and perish in a few years.

What we have written regarding the prospects of increased cultivation of the mango applies with equal force to many other hardy and universally grown fruits, such as the plantain, the guava, the orange, the red and white grape and the loquat. These trees will grow on all soils; though for the orange a *kunkur* or gravelly one is preferable. A great benefit to orange growing is shade, and no tree is better suited for this purpose than the "bair." Grapes are best grown in localities where the rainfall is scanty, or where the monsoon is late, and the best variety is a thick skinned one which resists the bursting action of the rains. Guavas may be cultivated to a state of great perfection, and in Etawah a species is grown that is almost entirely free from seeds and of charming flavour. A fruit garden should be laid out somewhat as follows:—A high wall should surround it to keep out jackals and protect the trees from storms. Inside it a row of "Jack" trees should be planted and inside them a row of mulberry trees, and inside them again a row of guava trees. This triple row all round the fruit garden forms an admirable screen for breaking the force of hot winds and storms. If the ground be extensive it should again be divided into squares, and rows by avenues of fruit trees, such as mangoes and li-chis, which are not injured by hot winds. The squares, thus protected, should be planted with plums, apples, lemons, pummeloes, plantains, oranges, etc. All kinds should not be jumbled into one plot, but a separate plot should be devoted to each kind so as to suit the canal irrigation to the wants of that particular kind of tree. There would then, too, be ample space amongst the trees for pine-apple plants, which prefer a certain amount of shade. On these lines a fruit garden should be a great success. Government might be induced to start a public garden on this plan, instead of maintaining the costly establishment it now does for horticultural gardens, mainly for the supply of vegetables and flowers for sale to European residents. —*Madras Times.*

PROLIFIC MANGO TREES.—An article on the cultivation of mangoes in Florida states:—The trees produce on the average from fifteen hundred to two thousand mangoes each, which sell in Southern markets from one to three dollars per hundred.—*Planters' Monthly.*

PERAK TEA.—We learn that a further consignment of Perak tea has come forward by S. S. "Achilles," which arrived in London on the 2nd inst. It consists of a very choice quality, which has been grown on account of the Perak Government. Mr. Koch, the Government inspector, will arrive here shortly and arrange as to its disposal. The inspector maintains that tea of the very finest description can be grown in Perak, as the soil is of such good and rich quality.—*L. and C. Express*, Feb. 13th.

THE STRAWBERRY GUAVA.

A. K. SMILEY, BEFORE THE REDLANDS HORTICULTURAL SOCIETY.

The guava belongs to the genus *Psidium*, a name derived from the word *Psidion*, a pomegranate, and belongs to the order *Myrtaceæ* or Myrtle family. There are at least six different species of guava —most of them belonging to the tropical regions. The guava jelly of commerce is principally obtained from *Psidium Guaiva*—a low-growing tropical tree found in the West Indies, and also raised in the southern part of Florida. There are a number of varieties of it, such as the pear guava, with white yellow pulp, and the apple guava with red pulp. This guava has become a necessity to southern Florida, and is to that region what the peach is to more northern climes. The pear and apple guavas prove hardy in this climate, but the reports are somewhat conflicting. Parties at Pasadena, in Los Angeles county, and Ballena, in San Diego county, report it to be hardy.

There is another species of the guava well suited to our climate—a beautiful, thoroughly hardy, easily raised evergreen shrub, fine for lawn or garden, called the strawberry guava, or in scientific terms, *Psidium Cattleyana*. Some authorities say that Brazil is its native clime. The fruit is globular, about one inch in diameter, borne in clusters of fine claret color, and flavored like a strawberry, hence its common name. The skin has much the consistence of that of the fig, but thinner. The interior is a soft fleshy pulp, purplish red next to the skin, paler towards the middle and white in the centre. It is juicy and in consistence is much like a Strawberry, to which it bears some resemblance in flavor. The foliage is of a rich dark-green color, thick and shining, resembling the Camelia. This shrub is one of most persistent fruit-producing plants in the whole list. One can frequently find on one plant, flower, half ripened and fully ripened fruit.

The Dictionary of Gardening says that the strawberry guava grows from ten to twenty feet in height. It bears fruit when very young. It can be treated as an ornamental shrub, or planted in rows from four to eight feet apart and raised as currants are.—*California Fruit Grower.*

SEASON REPORTS ON GRAIN CROPS IN CEYLON.

From the Abstract of Season Reports, February 1891, published in the *Gazette* of March 6th, we learn that in the Western Province the paddy crop was good or fair, except in the Hapitigam Korale, where it was poor, owing to want of water last September. The dry grain crop was also generally fairly good. In the Central Province, the Matale district was the worst off: for of the paddy crop the report was "poor, worst in Matale North," and of the dry grain crop "very poor." In Walapane too the dry grain crop was reported "poor." In Dumbara the paddy crop was also stated to be mostly a poor one. In the Northern Province the prospects of paddy and dry grain were on the whole good, except in Mannar, where half the paddy crop had failed; and in Vavuniya, where, except in two divisions which had rain, most of the crops must fail. In the Jaffna district tobacco was also extensively cultivated and was looking very promising, also benefited by rain. In the Southern Province the prospects were generally good, except in the Four Gravets and Talpe Pattu of Galle, and the Wellaboda Pattu of Matara, where the drought had affected the paddy; and the Girnwa Pattus, where all the crops were generally bad, owing to want of rain. In the Eastern Province the crops were good or fair. In the Batticaloa district, we are told, "Indian corn and chena products are plentiful and cheap except in Sinhalese villages on borders of Uva, where Indian corn was injured by the drought last year, and fine grain crops destroyed by locusts in January. Coconut crops promise well." In the North-Western Province crops were mostly very light, being affected by the drought. In the Chilaw district the dry grain crops were good; and we read: "Tobacco crop prospects northern division good." In the North-Central Province the maha paddy crop was nil, owing to failure of north-east monsoon rain for the third time; but the dry grain crop was generally fair. We also read: "Village tanks dry except a few in north-east and two in the south. Tank chenas all lost. Drinking water very scarce; some villages have none. Some partial showers fell during the month, which saved about half the growing kurakkan crop, which was dying. Anxiety about deficient food supply relieved. Prospects of yala crop depend on rains in April, May. Heavy rains fell in Tamankaduwa, which will allow of meda crop being cultivated." In the Province of Uva the paddy crops were good; the dry grain crop fairly good; the Indian corn crops everywhere good; and the kurakkan crops just harvested fairly good. In the Province of Sabaragamuwa the crops were good or fair.

THE RAPID OR SLOW ACTION OF MANURES.

We commend to the attention of our planters the remarks recently made by Mr. John Hughes, the well-known Agricultural Chemist, to our London Correspondent, and reported by the latter in his letter by last mail, (see page 660) on the subject of deferred action in the case of certain fertilizing agents.

The special case which has produced these remarks is one on which at the time it was first brought under notice we offered some observations. It may be as well just briefly to recall to the memory of our readers some of the more prominent points connected with that case. Mr. Hughes—whose opinion upon such subjects all will acknowledge to be of the highest value—had, while travelling throughout Italy and Spain, remarked the extremely unpleasant odour pervading many of the olive gardens visited by him in those countries. His inquiry as to the cause of this led to his acquiring the information that the odour was due to the quantity of rotting rags that had been applied with the object of manuring the olive trees. Mr. Hughes saw these, partly buried and in all stages of putrefication, in the gardens he visited, and his olfactory organs made him well realize the fact of the uncleanly habits of the peasants, whose cast-off garments were thus made to do a final and very useful duty. His knowledge of the constituents best adapted for fertilizing special forms of culture made him fully understand the value of this special application; but to that knowledge he added the important further knowledge that much of the value to be attached to the peculiar form of manuring must be due to the very gradual way in which the constituents were yielded up by the slowly decaying rags. It was this second property which induced Mr. Hughes to suggest the application of a manure having a kindred basis, on the widely celebrated Mariawatte estate. We have waited some time to learn what results have followed this application, and have only now done so. We hear that the manure was applied on a patch adjacent to another which had received a dressing of cattle manure, and that the observed result of a single year showed that the latter had had a far more striking effect upon the tea bushes than the former had had.

To those less acquainted with the science of manuring tea—for it is a science of the highest class—than is Mr. Hughes, this fact would have told against the "rotten rag" fertilizer. That

gentleman saw in it, however, a confirmation of his anticipations as to the peculiar value of this new stimulant. It proved to him that the new fertilizer was acting as had been expected by him, that is to say it was acting but slowly, but that while not stimulating to any sudden development, it was parting with its constituents after the manner which he believes to be best suited to the requirements and conditions of our climate. Mr. Hughes has drawn for us a contrast between the needs of home agricultural operations and those of a comparatively equable climate like that of Ceylon. In England, as he points out, the summer, the season for agricultural operations, is limited to a few months. The manures sought for by the British farmers must therefore be rapid in their action, they must yield their constituents to the soil as quickly as possible so that their effect may be achieved in the few brief months available. Here in Ceylon we are possessed of a climate which enables agricultural operations to proceed throughout the entire twelve months. "The more haste the less speed" is a well-known, trite, and often accurate saying, and in the case of manuring in Ceylon it would seem to be of special application. Undue forcing, as we well know, is injurious in many ways to the enduring strength both of animal and vegetable life. Slow development ensures a longer vitality in almost every instance to both forms of life. Mr. Hughes believes that the application of forcing manures to many forms of cultivation is distinctly detrimental, and this has been found to be the case on many of the sewage farms established throughout England with the object of disposal of town drainage. In cases of the kind where super-saturation has occurred, the plants grown, although large in quantity, have become coarse and incapable to a great extent of reproduction. Whether some such underlying principle as this may, as the result of the use of strongly forcing manure, have been in part accountable for a weakening of our coffee trees which have succumbed to leaf-disease we do not feel competent to decide. We know, however, that the point has been asserted by several among those who have endeavoured to account for our past troubles over this matter. Arguing by analogy, we can conceive it to be possible that the free application of highly forcing manures—and especially of those having a mineral basis—may in some degree have operated to weaken the coffee trees when at maturity, and the chance that this may have been so must make it much to be desired that the ultimate course of effect of the slower acting stimulant applied on the Mariawatte estate should be carefully watched and recorded. Animal excrement applied in England has a peculiar value because it parts so readily with its fertilizing constituents and enables the brief summer to be fully availed of. So with bones made soluble as superphosphate. No such characteristic is necessary or desirable in our own case, and we hope that important knowledge may yet be gained and useful conclusions arrived at from the Mariawatte experiment. It seems to be generally recognized that in the case of our new staple as in the case of coffee, we cannot do better than apply castor cake and ground bones in due proportion. If some fish manure is available so much the better. The bones contain some ammonia besides the phosphate of lime, and the castor cake contains all the potash wanted by a soil supplied by that ingredient from the decomposition of felspar and mica. The effect of such an application is expected to last for three years: at least that of the bones and cake, if the ammonia in the fish should be taken up more rapidly.

ARTIFICIAL DRYING OF "COCOA."

(From the "*Trinidad Agricultural Record.*")

Government House, St. Anne's, 8th Jan. 1891.

Sir,—You have doubtless heard of the "man in the street," and do not attach implicit reliance to his statement: I think the same may be said of the "Ceylon man." I may have been wrong in assuming that four-fifths of the cocoa exported from Ceylon was dried artificially. If so I freely admit it. What I wished to call attention to was the statement of the Director of the Royal Botanic Gardens in Ceylon that a hot-air apparatus "*for drying beans in wet weather is regarded as an absolute necessity and is universally employed.*" Whereas we have not half a dozen in this Island and the result is a loss to us of thousands of bags of good cocoa, and the manufacture of thousands of other bags of different stuff which go to reduce the prestige and average of Trinidad cocoa generally.

I now forward to you for publication further correspondence which I have received from Ceylon on this interesting subject and which I hope will be of use to cocoa planters.

The "Ceylon man" may have the benefit of the excessive rainfall stated by me.

The intention of my brochure was perfectly clear, and the general accuracy of my statements has been admitted at Kew and in Ceylon.—Yours, &c., William Robinson.

Queen's House, Colombo, 28th November, 1890.

Sir,—In reply to Your Excellency's letter requesting further particulars with regard to the artificial drying of cocoa in Ceylon, I have the honour to annex a copy of a letter received from the Director of the Royal Botanic Gardens at Peradeniya furnishing information as regards the temperature to be maintained for the process.

2. I have also much pleasure in sending you a copy of a Report by the Director of Public Works on my request to him for a model of the Fan and a rough drawing of the arrangement of the stove and air passages.—I have, &c., A. E. Havelock, Governor.

His Excellency the Governor of Trinidad and Tobago.

Royal Botanic Garden, Peradeniya, 13th Nov. 1890.

Sir,—In reply to your letter of 3rd November, I have the honour to inform you that I have made inquiry of several leading growers of cacao as to the point referred to by Sir W. Robinson, and now forward the result for His Excellency's information.

1. No definite temperature is maintained in the house during the process of drying. The object aimed at is to get the room as hot as possible with a good strong current of air passing through. This is practically limited by the comfort of the coolies employed in it. In the small drying house described in my former letter the thermometer is marked at 110° F., and the coolies are instructed not to allow it ever to fall lower. One or two men have to be always inside turning over the cacao, and occasionally moving the trays from the hotter to the cooler end of the house. This is very necessary when there is much wet cacao in the house, as the damp gets down forward by the current and is apt to sweat rather than dry the cacao at the end next the exit of the air. One planter tells me that he has known the temperature in his house as high as 170° F., but there is a general consensus of opinion that 120°-140° is the highest that is required.

2. The main point is to keep the fans going. In the small drying house described this is effected by hand-power; but it is of course much more efficiently done by steam or water-power. Jackson's tea-drier has been found a perfect cacao drier, and the American fruit-drier has also been used here with success.—I am, &c.,

Henry Trimen, Director.

Hon. the Colonial Secretary, Colombo.

(*Copy of Report referred to.*)

Sir,—I annex copies of letters from Messrs. John Walker & Company, Messrs. W. H. Davies & Co. and Mr. H. J. Vollar of Pallekelly on the subject.

From these it would appear that no special fan or stove is in general use in Ceylon, any ordinary stove and an air propeller to cause a draft of hot air through the room being all that is necessary. * * *—ROBERT MACBRIDE, Director of Public Works.

The Hon. the Colonial Secretary, Colombo.

From *John Walker & Co. to R. D. Ormsby, Esq.* 19th Nov. 1890.

Sir,—We are sorry we have no fans or stoves in stock. What was used is a Clerihew stove with exhaust fan. We have not made any for some years. —DAVID PAGE, Manager.

From *W. H. Davies & Co. to R. D. Ormsby, Esq.* Colombo, 19th Nov. 1890.

Dear Sir,—Referring to your letter of date, if an ordinary stove is erected at one end of a room and a propeller at the other to draw the warm air through the tats on which the cocoa is spread, you will find this all that is necessary. Propellers can be had from any size 12 deg. to 60 deg. diameter. * * *—Yours, &c., W. H. DAVIES & CO.

From *Mr. H. J. Vollar to Robert Macbride, Esq.* Pallekelly, Kandy, 19th Nov. 1890.

Sir,—In reply to yours of 15th I would have no objections to any sketches being made of the fans used for drying cocoa. If it is only the fans, however, that are required, it would be unnecessary for you to send any one to sketch them, as Blackman's air propeller is found the most suitable, and one of them should, I think, be easily found in Colombo. * * * —H. J. VOLLAR.

NOTES ON PRODUCE AND FINANCE.

INDIAN AND CEYLON TEA IN RUSSIA.—We understand that the Russian merchants who, only a few months since, so strongly protested against the introduction of Indian and Ceylon tea into Russia are beginning to see the error of their ways, and that since the opening of the magazine for the sale of tea by the Ceylon representative. the prospects for the sale of Indian and Ceylon teas have decidedly improved.

A HIGHER STANDARD.—A correspondent of the *Grocer*, moved by reading an account of the high price realised at the recent sale of the parcel of fine tea, says:—"As an old grocer I cannot but think that the present feeling should prompt the trade at once to graduate their prices and aim at a higher standard of tea altogether; the time and occasion are most opportune, and should be utilised uniformly and universally. The grocer has now a chance of retrieving his long-lost dignity as a tea vendor. Grocers' associations and co-operative societies can do much to counteract the vile stuff as sold by reckless adventurers. Why should tea (the greatest socialising beverage) be made the target of unscrupulous traders?" Echo answers why? and the answer is because a large number of people in the tea trade, having no scruples in particular, and being utterly indifferent to all standards but that of the largest profit, sell whatever they can find a market for.

THE PRODUCE CLEARING HOUSE.—Although the facilities for speculative dealing in produce afforded by the Produce Clearing House are not likely to find favour with the steady-going Mincing Lane stagers of the old school, the Clearing House is evidently a well-conducted establishment. In his speech at the fourth ordinary general meeting of the Company, the Chairman said that the members felt that their system was a necessity under the new condition of trade, and, time being on their side, their future might be considered as beyond all doubt. Their engagements during the past year had amounted to £36,500,000, and in fulfilling these engagement they had not made a single bad debt, nor had they had a single dispute with any of their customers to refer to arbitration.—*H. & C. Mail*, Feb. 20.

DR. VOELCKER's full Report on his deputation to India will be published in England and sent out to the Government of India. He left however, an abstract of it with the Government before his departure, and this, together with the recommendations of the Agricultural Conference held at Simla in October last, are now before the Provincial Governments for their consideration.—*M. Mail.*

A WYNAAD PLANTER writes:—"We, the few North Wynaad planters, look forward with hope and say verily the bumper is bound to come next year, not of fever mixture but of coffee. We had a heavy shower last week, which has pushed out a fine show of spike. Coffee is R350 per candy. of 660 lb. The pepper crop has been bad, very bad; but the price is going up."—*Madras Mail*, March 2.

CHINA TEA TO BE BLOTTED OUT OR REVIVED. —The Foochow *Daily Echo* is terribly exercised about the gloomy prospect before China tea and winds up an editorial on the subject as follows:—

If the stern fact of thousands of Chinese who are entirely dependent upon the trade for very existence, being out of employment, and if reports be true, verging upon the brink of starvation and the yearly and serious decrease in the lekin and Export duties levied upon Tea, are powerless to appeal to the hearts, or the pockets, of the Imperial Officials; it is beyond our power to hazard a remote guess as to what *can* be done, though any body of merchants might advance an army of feasible propositions. At present, the barriers between the introduction of improved methods of growth, cultivation, and manufacture, are impenetrable. No foreigner can acquire land for the culture of the plants under improved methods, nor is there any protection for the investment of capital or introduction of machinery, under European auspices. While even the more intelligent and progressive among Chinese merchants, are themselves afraid to lend their aid toward the desirable end;—standing as they do in dread of the populace, and possibly also of their own officials.

If however, it could be conceived possible, that protection should be accorded them, and machinery such as used in the manipulation of Indian leaf, was allowed to be set up in the various Tea districts,—and provided the same degree of care and attention was bestowed upon the leaf as upon Indian gardens,—or even the plants were allowed to be grown, and the leaf manufactured under experienced supervision, (not necessarily foreign by any means but upon the lines proved by experience to produce better results); then, it is our opinion, that Ceylon and India would find a very powerful and popular rival in the Teas, which we know from experience of long years ago, can be produced in the mountainous districts around us. We submit—that while it is desirable that encouragement, and protection, should be granted to Europeans desirous to acquire land in the interior, it would be a wise measure, on the part of the Chinese Government to first assure such protection to their own people. Also, as far as is consistent with justice, they should insist upon the Tea growers taking more care of their plants, by pruning and weeding, while every encouragement should be afforded to such as desire to adapt their methods of manufacture to the requirements of the age, and produce Teas more in accord with the public taste. Not on European markets alone but in Australia, America, and Canada, the taste for Indian and Ceylon Teas is rapidly increasing, and such once deeply rooted in the public mind, will be extremely difficult to eradicate. Any measures to be taken to revive the taste for, and improve the quality of, China Congou, should be set in motion at once, and before its traditional merits are a matter of history. It is held by some that the panacea for the evil lies in the entire removal, or at any rate modification of the export duties, but we consider that the first and most important question is rather the improvement of quality, to which end strenuous efforts should be made.

THE CEYLON SPINNING AND WEAVING COMPANY, LD.

It has been a subject of considerable surprise to us that in view of the very satisfactory Report given by the Directors at the recent shareholders' meeting, the credit of this Company should be rated so low as it is in our local shares market. The explanation given to us of R100 paid-up shares being quoted at R80 or less, is that the Chetty shareholders are sometimes very impatient of any delay in getting a return on their money. They are accustomed to turn over their capital very quickly in their rice and cotton goods' ventures and do not at all like to have any portion locked up for a long interval. If this be the fact, it is evident that Chetty capitalists are scarcely the society from whom support for Limited Companies can be sought; for there must, even with the most promising, if not successful, Company, always be a preliminary interval to allow of the needful testing and earnings before dividends can be declared. We have been anxious to get the opinion of an outside authority on the Report and balance-sheet af the Company, and have been successful in inducing a gentleman of experience in no way connected with the Company, to put his pen to paper. The following then is the opinion of an impartial and experienced observer of tho Report and work done by the Company's mills as recorded at the recent meeting of shareholders:—

"I have no practical acquaintance with cotton mills in the East; and since my day everything at Home has undergone a complete change. Still as you ask me for my candid opinion of the prospects of the Colombo Mills just opened only, I have no hesitation in stating that it is an exceedingly favourable one. The Report and statement of accounts appear to me to be both straightforward and satisfactory; and I have no doubt that ere many years are passed the Company's operations will be on a far more extended scale than they are at present. The climate is everything to a spinning concern. It must be about twelve years ago I pointed out this great advantage of climate possessed by Colombo over India, and I was then urged to interview the late Messrs. De Soysa, Jusey de Silva and other wealthy and influential Sinhalese and endeavour to get a mill started on the lines of those at Madras. My idea then was to locate the mill near to Cotta, where a working population at very cheap rates could, I thought, be counted upon to a certainty. But the mill now erected has secured a better locality, for it has the advantages of both canal and rail, tho former *at its very doors* and the latter nearly so. There have also been in the interval of twolve years extensive improvements in engines and boilers and spinning and weaving machinery generally. The Colombo mill has been able to avail itself of *all* these, and is therefore better off in this respect than the majority of Indian mills, the bulk of which, however, are nevertheless doing a profitable business, weighted though they are with heavy commissions, &c. The opening up of Colombo into a great port with steam communication constantly available to all parts of the world is also another great advantage, for the mill, in its operations, is not limited to simply a local demand, very often more than over-supplied, owing to keen competition by the production of Lancashire factories.

"The dyeing department ought to be a profitable one now-a-days, thanks to the splendid colors now shipped at cheap rates from Germany and the very simple manner in which they can be used, even after only a lesson or two, by natives without European supervision. In time, no doubt, a large business will be done in cleansing and redyeing articles of apparel generally; collecting agencies on the Perth (Scotland) principle being distributed over the lines of island railways if not even established at some of the adjacent Indian ports. To emphasize what I say on this head, look up Indian Customs House return and give the figures for values of Dyestuffs imported from Europe during past five years—the increase is astounding I believe. In Bombay the trade has developed enormously—why not in Ceylon?"

In accordance with the request of our correspondent, we append the figures for comparative imports of dyes for nine months of each of the past three years, namely,—

DYEING AND TANNING MATERIALS.
Nine Months, 1st April to 31st December.

	1888.	1889.	1890.
	ozs.	ozs.	ozs.
Aniline and alizarine dyes	28,870,422	37,700,630	45,493,396
	cwt.	cwt.	cwt.
Cochineal ...	1,461	1,499	2,040
Cutch	4	14	8
Gambier	12,903	12,609	15,308
Madder or manjit...	4,618	1,932	3,409
Saffron	160	138	190
Other sorts ...	15,690	19,114	12,474
	VALUE.		
	R.	R.	R.
Aniline and alizarine dyes	16,12,876	24,25,256	26,54,017
Cochineal ...	1,30,831	1,28,960	1,68,091
Cutch	63	179	158
Gambier	2,87,894	3,38,821	3,60,483
Madder or manjit...	55,753	21,830	37,409
Saffron	3,29,615	3,02,267	3,81,996
Other sorts ...	1,70,841	2,31,371	1,68,686
Total ...	25,87,873	34,48,684	37,70,840

Later on, our correspondent wrote as follows:—

"Cotton Factory.—I forgot when writing to you to include as a favourable feature the tendency of silver to fall to a low point again. The lower that exchange falls the better it will be for the factory for exchange on the cost of manufacturing in Lancashire and on the freight of the goods shipped to the East must, of course, be recovered from the purchasers here. The price of the raw cotton on the spot is scarcely a factor, for a low exchange causes prices to rise equally against those who buy cotton to export and those who buy cotton to manufacture locally."

SALES OF COCONUT ESTATES.

It is satisfactory to find a veteran like Mr. Charles Byrde* going in for fresh plantation property. He has just sold out of Elston in the Kelani Valley for £4,500 and invested part of his money in coconut properties close to Ambalangoda which—bought at R20,000—ought to pay well with a railway at their gate, to carry the produce to Colombo. We wish Mr. and Mrs. Byrde all success. A contemporary records the sale as follows:—

We learn that Sinnagoda and Bellevue estates at Ambalangoda, belonging to the Eastern Produce and Estates Company Limited, have been purchased by Mr. Charles Byrde for R20,000 cash. The estates are 290 acres in extent, of which 199 acres are fully planted with coconuts, 33 acres with cinnamon, while 58 acres are paddy fields and waste land. The estate will be 1½ miles from the proposed railway station.

COFFEE, TEA, COCOA, &c.

COLOMBO COMMERCIAL COMPANY, LIMITED.

Report presented to the Sixteenth Ordinary General Meeting of the Company, on Monday, the 23rd day of Feb. 1891, at 12-30 o'clock p.m.

The Directors are now able to place the following

* His brother, Mr. F. W. Byrde, turns out to be the purchaser,—ED. *T. A.*

annual accounts before shareholders, viz :—

Profit and loss account for the year ending 30th September 1890. Balance Sheet made to 30th September 1890.

It will be seen from these accounts that the result of the year's operations is a profit of...	£3,281 11 9
A balance was brought forward from last year of	128 8 9
Making a total at the credit of Profit and Loss of	£3,410 0 6

The Directors propose to apportion this sum as follows :—

To the payment in full of the Dividend on the 6 per cent. Preference Shares for the year ending 30th September, 1890	£1,089 0
To the payment of a Dividend of 3 per cent on the Ordinary Shares for the same period	2,100 0 0
To be carried forward to next account	221 0
	£3,410 0 6

The General Trading business of the Company has shown an increase during the year, and with careful management the Directors look forward to its steady development. Owing to the rise in the price of Silver, the result from the working of the Company's Estates during the past year was not so satisfactory as anticipated. Silver having now fallen in value, and the market for Ceylon Tea being favorable, the current year's working of the Estates is expected to show a marked improvement. During the past year the area under tea on the Company's Estates has been somewhat increased, and it is the intention of the Board to gradually extend this cultivation as opportunity arises and labour admits. The Coffee Market is very good, and of the small area under coffee still left on the Company's Estates a few fields are producing fair crops but the future of this product in Ceylon is very uncertain, and the Directors do not, therefore, rely on the returns to be derived from it. Mr. John Brown, Chairman of the Board, left for Ceylon in November, and will inspect the properties in which the Company is interested.

BALANCE SHEET, 30TH SEPT. 1890.

Dr.

Capital authorised :—

	£ s. d.	£ s. d.
10,000 Ordinary Shares of £10 each ...	100,000 0 0	
20,'00 6°/₀ Preference Shares of £5 each ..	100,000 0	
	£200,000 0 0	
To capital issued—		
10,000 Ordinary Shares, £7 paid.. ...	70,000 0 0	
3,630 Preference Shares, £5 paid.. ...	18,150 0 0	
		88,150 0 0
To Debentures... ...		10,100 0 0
Do Bills Payable ...		11,100 0 0
Do Loans, Ceylon ...		2,500 0 0
Do Loans, London ...		3,500 0 0
Do Sundry creditors, Ceylon		3,942 6 0
Do Sundry do London...		5,933 3 6
Do Profit & Loss Balance...		3,410 0 6
		£128 635 10

Cr.

By Colombo Establishment—

	£ s. d.	£ s. d.
Freehold Premises, Buildings, Machinery, &c...	20,000 0 0	
Do Estates	70,000 0 0	
As per last Account... ...		90,000 0 0
Do Machinery &c., as per last Account		2,408 4 1
Do Advances against Crops... ...		17,282 12 6
Do Sundry Debtors, Ceylon... ...		15,476 2 3
Do Stock of Bones, Stores &c., in Ceylon		12,176 16 10
Do Cash at Bankers and in hand, Ceylon		936 5 3
		138,280 0 11
Less Exchange		21,129 4 11
		117,150 16 0
Do Bills Receivable		1,550 0 0
Do Sundry Debtors, London.. ..		1,485 6 0
Do Produce in London and afloat		4,029 9 9
Do Office Furniture, London ...		150 0 0
Do Cash at Bankers, London..	4,255 9 9	
Do Cash in hand, London...	14 8 6	
		4,269 18 3
		£128,635 10 0

PROFIT AND LOSS ACCOUNT FOR YEAR ENDING 30TH SEPTEMBER, 1890.

Dr.

	£ s. d.
To Salaries and Office Expenses, Colombo	2,309 2 3
Do Rent, Salaries, and Office Expensee, London	351 14 6
Do Director's Fees...	400 0 0
Do Audit Fee	26 50
Do Income Tax	51 9 0
Do Interest on Debentures	612 0 0
Do Balance carried down—Profit ...	3,281 11 9
	£7,032 2 9
To Balance carried to Balance Sheet ...	3,410 0 6
	£3,410 0 6

Cr

	£ s. d.	£ s. d.
By Profit on Curing, Milling, and General Trading Account		7,032 2 9
By Balance brought down—Profit 1889-90		3,281 11 9
Do Balance from last account.. ...	2,617 8 9	
Less Dividend paid February, 1890 ...	2,489 0 0	
		128 8 9
		£3,410 0 6

A MOST CELEBRATED TEA MARK.

How are the mighty fallen, &c. What is described as an unique opportunity, and a magnificent chance for tea-dealers and grocers, is the sale of the mark T. B., in a diamond in white on a black ground. The handbill announcing the sale states that the Mark has been the leading importing Mark for over thirty years, and is the most celebrated tea Mark in the world, and, if properly advertised, it should at once take up the position of leading retail Mark. We might suggest that a firm which has been so eminent and regular in its sales of tea at the Rooms, now that there are no more chests or half-chests to be sold without reserve, might be true to their old policy, and put up the Mark for sale at the same place, "Fog or no Fog." It would be a novelty, at all events, and enterprising dealers might come and make their bids.—*L. and C. Express*, Feb. 20.

"CEYLON AND IRRIGATION."

is the heading of a further letter by Mr. Alfred Deakin (the probable future Premier of Victoria) in the Melbourne *Age* received by today's mail. This contribution is so full of local colouring and interest that we reproduce it in full. Mr. Deakin, it must be confessed, writes with more accuracy and insight than we could have expected from his short visit to the island. Of course, there are some slips in his letter, but none very glaring, unless it be the statement that the import duty on rice does not affect the scale of wages paid by the planters. That dear or taxed food has a corresponding effect on wages is acknowledged all the world over, nor is Ceylon an exception; for certainly the abolition of our Customs levy would lessen the cost of Indian rice to coolies and planters, and either the former would have to take less wages per day, or the latter would pocket the difference in the cheaper rice which they purchased and supplied to their coolies. Then again, Mr. Deakin heard nothing in Ceylon apparently of the grant-in-aid system through which the Ceylon planters pay in direct contribution half the cost of their district roads. Still more our Australian critic ignores the point of our general revenue being largely benefited through railway profits, these therefore constituting undoubtedly an indirect medium of taxation. Of course, the tea, coffee, cinchona and cacao plantations contribute the vast bulk of railway receipts through rice, machinery, manure and general goods carried up and produce down. If there were a general "land tax," which Mr. Deakin, like everybody else, would consider the proper and scientific mode of raising the larger proportion of the general revenue in Ceylon, undoubtedly railway rates would have to be adapted until no more than working expenses and interest with sinking fund contribution for debt, were provided. But as we personally pointed out to Mr. Deakin, could there be a better or fairer way of dealing with plantations than by a tax which is strictly proportioned to the quantity of crop gathered and despatched, the requirements in rice, &c. being nearly always in proportion to the outturn of produce. Considering the time of Mr. Deakin's visit, it is not unnatural that he should come to the conclusion that "Irrigation" was the one great subject of political and administrative discussion before the Government and public of Ceylon; but had he remained a little time longer, he would have seen how mistaken was this view, seeing that no reference whatever was made to it in the annual Reports of either the Planters' Association or Chamber of Commerce of the Colony. Mr. Deakin as a democratic, practical politician, is keen enough to see the futility of discussing such a one-sided unjustifiable proposal as the abolition of one rice-tax without the other, and he appears to favour a scheme which has for its basis the recommendations of the recent Select-Committee on the subject. To this we take no objection—indeed it is the policy we have all along urged as the best adapted to the case of Ceylon at present and for twenty years to come. Certainly, it is the arrangement which is best calculated to save the native agricultural classes in the island from a change which they would have reason to regret far more than their experience of the present system of taxation so far as it affects them.

CEYLON AND IRRIGATION.

BY ALFRED DEAKIN.

Those by whom Ceylon has been considered a Crown colony of Oriental stagnation, where a despotic but indifferent Governor presides on the one hand over a handful of effete Europeans enervated by the climate, and upon the other hand over a great body of natives hostile to every form of change, both classes being entirely excluded from participation in the Government of the country in which they live, are cherishing an unpardonable delusion. The natives, it is true, have multiplied rather than advanced, the planters have had a keen eye to their own interest rather than to that of the colored races, and one or two of the Governors have spent their terms of office in mere routine; nevertheless, these have not been the most prominent circumstances in its recent history. The representatives of the Queen have for the most part striven hard to do their duty, and as a rule they have been supported by their white and appreciated by their brown subjects. The industrial vicissitudes which have here succeeded each other with rapidity have only developed among the planters a courage and an energy which reflect honor upon them. Through times of prosperity and times of depression the Government has pursued its way, and undauntedly coped with each crisis as it has occurred. From one motive or another the leading natives have joined to some extent in the forward movement, from which they have incidentally benefited. In spite, therefore, of a few palpable blunders and some intervals of paralysis, the island has been steadily progressive and has evolved by degree a progressive policy worthy of the examination of self-governing colonies.

The population of Ceylon has more than trebled nder British rule, and its production has several times trebled. Its revenue from all sources, including railways and water supply, amounts to £1,500,000, two-thirds of which is received for services rendered, and only one-third of which is raised by taxation. Optimists claim that neither race of the inhabitants have suffered from this burden, and that if the Secretary of State for the Colonies assents to a proposal now before him for a further reduction of the grain excise neither race will know that it is taxed at all. There appears to be some ground for this contention. Certainly the indebtedness of the colony is insignificant, since it requires to pay interest upon only £2,300,000, while its railways, upon which £4,600,000 has been spent, pay interest, have repaid a considerable portion of their original cost, and would now sell for much more than the total of the colony's obligations. Financially, therefore, the position of Ceylon is strong and its future hopeful. As a rule its soils are less rich than those cultivated for the same products in India, but constant moisture and constant heat give its climate the effect of a forcing house and render production equable as well as large. The cost of irrigation and the rent of land to the Government are less than the average in the peninsula. In brief, while every prospect pleases as much as in the days of Bishop Heber the more humane conclusion has been arrived at that man is not viler here than elsewhere, and this has been coupled with the further conviction that his labor can be made very profitable to himself and to the empire.

At first sight it may appear remarkable that Ceylon should have required an irrigation policy at all, and still more that it should have come to occupy the most prominent place in its politics. The staple products such as those from the coconut, which with tea, coffee, cocoa and spices furnish the wealth and export of Ceylon, are none of them irrigated, and most of them are grown in regions which enjoy an ample rainfall,

The whole of the crops which the planter raises and Enrope purchases are obtained in profusion without artificial watering, and the direct interest therefore which Englishmen or an English Government can have in irrigation is absolutely *nil*.

There is but one product that receives irrigation in Ceylon, and that is rice, a food which can be obtained from Bengal and Burmah, where the yield is much greater than in Ceylon, at a cheaper rate. It is produced and consumed by natives only, since the requirements of the small white population could be more than satisfied by a single shipment in a year. To buy in the cheapest market must always mean to buy imported rice. According to all principles of political economy acknowledged in Great Britain, and also according to the selfish interests of the ruling class, which are certainly as lively in Ceylon as in other parts of the globe, any sanction of the growing of rice in the island should be forbidden, while the expenditure of public money upon works for its encouragement should be stigmatised as utterly indefensible.

The British Government of this tropic colony, however, appears to have set itself the task in this one connection of traversing every accepted university doctrine. It has fostered the growing of rice both by legislative and executive action; has spent public money liberally to encourage and extend the cultivation; and has crowned its edifice of economical heresy by the imposition of an import duty with a protective incidence upon imported rice. That nothing might be wanting which could add to the enormity of its offences and constitute its action the unpardonable fiscal sin it has placed this protective duty and a smaller excise to boot upon what is and always has been the chief food of its people. To seek to benefit them by taxing the one grain upon which they live, and to procure which they require to devote almost the whole of their labour and their small earnings, is surely a phenomenon that calls for comment from all sorts and conditions of critics. Yet, in the island the principles of this policy are cordially approved, because they are held to be justified by its circumstances and also by results. The policy has not been accepted in silence, though the challenge which it has provoked relates only to the extent of its application. The challenge fortunately puts us in possession of the reasons why the island has dared to strike out for itself a practice suited to its own conditions and people, notwithstanding its conflict with the mathematical axioms of economics, which take account of none of these things.

The first justification offered is truly Oriental. Rice always has been taxed, and to replace the existing imposts by any other, no matter how equitable, would be to create endless discord and disaffection. Hamlet's principle of proferring the ills he had to possibilities of which he was uncertain lies at the very root of the conduct of public and private affairs in Asia, but does not affect the merits of the case.

The second justification for the Government's interference is that though a large part of the revenue derived from taxation is obtained from rice, the grower at all events gets his contribution returned to him. There is an excise on rice grown on the island, which yields nearly £100,000 a year. The argument is that as the natives grow and eat the rice which is so profitable to the State, they are entitled to receive back again a proportion of this profit in the shape of grants. Accordingly, under the law, one-fourth of the receipts from excise is set apart each year for what may be termed the ordinary outlay upon irrigation schemes. In addition to this, about another fourth is voted annually for special works, so that one half the excise is held to be repaid in this way. The proposal now before Lord Knutsford provides for a further commutation of the excise which, if approved, will reduce the net receipts of the State by yet a third fourth of the present receipts, while it is argued that the last fourth, which would be retained permanently, is only fair payment to the Crown for general purposes and all the indirect expenditure incurred in connection with the management of the irrigating works. The weak point in this calculation is that while all rice growers are taxed, only those who receive the benefit of this Government expenditure have had any return, and these are but a small proportion of the whole body, most of whom receive their water supply from schemes constructed long before the advent of Europeans. In the past no balance of this kind has been kept. From 1884 to 1887 the grain tax yielded £409,000 while the total expenditure upon irrigation works and their maintenance was £168,000.

In reply to such a calculation it is impossible of course, to say that a large portion of the grain receipts are rent for land held from the State directly, and not a tax; but this at best is an imperfect adjustment, and merely relates to that proportion of the excise raised in excess of the sum levied upon pirvate proprietors of land. It would be necessary to prove that it was equivalent to other Government rents in order to give this view much weight. Another contention is, that the natives get the benefit of the import duty, which is to the excise as 10 per cent is to 7½ per cent, and that, therefore, they are 2½ per cent the gainers. The free trader would probably urge that this is unjust to the consumers, who are chiefly natives. While a protectionist would reckon the margin too small to be of any permanent value and urge the abolition of the excise altogether.

The fact cannot be disguised that out of less than £500,000 of taxation rice alone pays nearly £300,000, an excise of £100,000 and an import duty of £200,000. As burdens should be distributed in proportion to wealth this is too large a share. The planters contend that as they are the employers of native labour they pay their share of the rice tax in increased wages, but it is doubtful if these are appreciably affected by either the rise or fall of rice. The 6½ per cent on general imports and a small export duty to cover the expenses of medical supervision of their laborers are all their contributions to the State, in all little more than £150,000 a year, which is not an excessive amount certainly on a capital of nearly £8,000,000. Figures such as these assuredly strengthen the case for a generous outlay upon water supply for the use of the natives.

Further justification—and perhaps it would not be too much to say the real justification—is to be found in the fact that, although the island is exceptionally rich in the coconut, bread and other fruits, as well as in vegetables and yams, which the Sinhalese use, yet rice is their chief food. It produces, at all events, in many parts of the country, the best result for the least labor. Its cultivation has been pursued from immemorial antiquity, and is better understood than any other. The British Ruler has been compelled to adapt his views to the character of his native subjects. Rice growing is an honorable pursuit among the Sinhalese, and they would probably refuse to attempt the raising of any substitute. When they obtain little rice they suffer from prarega, a malarious fever analagous to that known in Italy; when they get none they sometimes die of starvation, and thus to preserve health and life to them rice culture is rendered a necessity. When, in addition, it is remembered that the Government derives so large a revenue from this source there need be no surprise if the industry is fostered to the utmost possible extent, and that the whole weight of the Administration is cast in its favour.

Irrigation has been the chief article in the programmes of successive Governors, and their provincial officers have pushed it enthusiastically. There are six honorary titles in the gift of the Crown which are much prized among native notabilities, and by their means it is said that irrigation enterprise is rewarded and schemes are encouraged. The planters are inclined to complain that the paternal solicitude of the State is devoted too much to this one branch of industry, but taking all things into consideration it is hard to see how it could be otherwise. Other products might be encouraged, it is true, but rice is likely to remain first in the needs and tastes of the people.

The natural difficulties in the way of the cultivation of rice are naturally made much of by the

opponents of irrigation, and even its advocates are unable to ignore their seriousness. It is a thirsty crop, and the provision of a sufficient supply of water by means of storage is therefore most expensive in proportion to the area affected. Then again the rich deltaic soils of the Ganges and the Brahmaputra, with their annual floods richly laden with silt, secure crops which are 50 fold to 80 fold of the seed sown. There is much argument as to what may be considered a fair return in Ceylon, and as rice is grown almost everywhere, there are, as is natural, very different returns. In some districts it s insisted that the harvest gives only 4 or 5 fold, while the average claimed is not more than 15 to 18 fold. It is confessed, therefore, that the island is heavily handicapped in this regard, and cannot compete with the mainland. In 1888-89 India exported nearly 7,000,000 cwt., while Ceylon imported 3,330,000 cwt. Sometimes it has been questioned whether rice growing does not involve an absolute loss to the Sinhalese farmer, and very careful estimates of his working expenses and profits have been made. The result appears to show that in certain districts which are well irrigated, such as Matara and Batticaloa, it pays well, but that in others it yields only a bare profit. The doubt has arisen whether the limit of its payable production has not been reached, and certainly, the fact that some 6,000,000 bushels annually have been bought from India during the past few years would seem to lead to such a conclusion. On the other hand, Mr. Elliott, the Government Agent at Batticaloa has conducted some careful experiments in rice growing by means of hired labor in two districts with which he is intimately acquainted, and gives a balance sheet which shows a profit of 40 per cent. in the one instance, and 70 per cent. in the other. If such profits are open to the average cultivator, as many believe, there is still a fine future before the Sinhalese and Tamils of the low country, and the Government policy is abundantly justified.

The Hon. Mr. Grinlinton, M. L. C., has propounded a scheme which would do much to remove the admitted irregularities in the incidence of the grain tax by adjusting it exactly to local conditions. He proposes that all rice fields yielding less than 4 fold should be exempt from the tax; that those yielding from 5 to 7 fold should pay 5 per cent. on their grain returns; from 7 to 10 fold, 7½ per cent.; and above 10 fold, 10 percent. If coupled with a liberal irrigation policy such at lan appears to possess much to recommend it. All thre can be asked is justice. The alternative would be to iomit the taxation and stop expenditure upon irrigatsn altogether. So far no one has ventured to make uch a proposition. Were the import duty allowed to remain. it would then become distinctly protective in its incidence.

There is one tax which already falls upon both races alike, though it ignores all differeuces in wealth and power of wage earning. It is a capitation tax payable either in labor or cash, giving the option to each citizen of manual work upon some public work for a fixed period in each year, or of paying what is considered the native equivalent, 3s. a week in town or 4s. in the country. The Europeans and well-to-do natives pay this trifling sum, while the less fortunate bulk of the colored people prefer to work. Of course the sacrifice they make in this way is relatively vastly greater than that demanded of the whites, and this may be urged as a further point in their favor.

The magnitude of the rice interest, and therefore of irrigation, must continue to force its circumstances upon public attention. The Government returns give 574,000 acres as now under this crop, while those of the Messrs. Ferguson are 700,000, and their anticipation is that the total will soon reach 1,000,000 acres. The State already exempts from taxation for four years land that is being brought under the plough for the first time; by its system of commutation does much to reduce its demands, upon the cultivators, and by allowing them to make their contribution to irrigation schemes in labor, instead in coin has fostered a feeling of community of interest between them and the Administration. Apparently therefore, there is not a great deal to be done and this may be done without much difficulty, to convince the Sinhalese and their fellow natives of the absolute equity of the Government under which they live, and of the sincere desire of the whites for their prosperity and progress. To that desire is due the, at first sight, surprising fact that Ceylon is an irrigating country. The public welfare has been held to be the supreme law and that welfare has demanded the adoption of a bold irrigation policy.—Melbourne *Age*.

MINING AND GEMMING.

A new departure has been taken by the London Syndicate to which Mr. Barrington Brown reported, in sending out a practical mining agent, Mr. Bettison, of much and varied experience. His attention so far is confined to plumbago and he has been visiting some of the native mines, with reference to their working and the application of machinery. But we confess we rather regret to see this Syndicate going to work after what is a "one-horse" style. We had hoped to see Mr. Barrington Brown himself back at the head of an adequate staff and requisite machinery to give both our gemming and mining an adequate trial sufficient to satisfy everybody with good success or the reverse.

OUR BOTANICAL AND ECONOMIC GARDENS.

The publication of the annual Report of Dr. Trimen and his capable Assistants constitutes an interesting event of the week. We issue all the material portion as a *Supplement* and elswhere review the same. We should like to see more power given to Dr. Trimen to be able to follow up his distribution of seed—of cacao, for instance—with enquiry and inspection to see what was done with it. We require in Ceylon indeed, a far closer relationship and united form of working in respect of the several departments bearing on the promotion of native and State Agriculture:—Revenue-provincial, Forestry, Educational-Agricultural and our Botanic-Economic Gardens in which most of the science is centred. There can be no doubt that if a properly representative "Agricultural Board" existed—such as we have advocated for many years back—a great deal of frittering away of public money and loss of time would be saved, mistakes would not so often occur, and much more good would be done in benefiting the native agricultural community and in developing the resources of the country.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Feb. 19th.

Annatto.—The large quantity of 118 bags bright seed from Ceylou was shown today. The price asked for this article is 2½d per lb., but there were no buyers.

Arecanuts.—A parcel of 20 bags was shown today, for which tho pricc of 30s per cwt would be accepted.

Cinchona.—Another heavy arrival of 177 bales Sonth American Guayaquil bark was for the greater part disposed of today at a fresh reduction in prico of at least 2d per lb ou an average. Good bright quill sold at 1s; partly stout ditto, bright mossy but broken 8½d to 9d; very stout flat spilt quill 9d; broken aud rusty brown at from 6d down to 3½d per lb; 42 bales Maracaibo bark of good appearance were bought in at 9d per lb. Several parcels of flat Calisaya were also bought iu, and only 9 serons damaged sold without reserve at 7½d to 8½d per lb. For a uew parcel of 116 bales from Rosairo, bright flat orange 1s 5d per lb is asked, an offer of 1s 4d being refused. Some very ordiuary red bark, in thin broken quill of every little colour, realised 1s 1d per lb.

COCOA LEAVES.—Some cases Ceylon leaves were shown today. These leaves were of mixed size, Huanoco character, dark in colour, but strong. Most of the leaves were damaged, and an offer of 2d per lb was the best which was made. It was refused. The New York market on February 1st was almost bare, only a few parcels of light-green leaves remaining on hand.

ESSENTIAL OIL.—Of Citronella oil, 50 cases in tins sold today at ⅝d per oz.; while for oil in bottles ⅞d is asked by some holders.

COFFEE CONSUMPTION IN THE UNITED STATES IN 1890.

This fell off in 1890, being the slightest since 1887. The figures showing the movement at all ports, exclusive of the Pacific coast, indicate a total consumption of 209,457 tons, against 216,085 tons in 1889; 216,833 tons in 1888; average for three years, 214,125 tons. Prices were higher and this probably accounts for the shrinkage.

The yearly average cost of Fair Rio was 19·64 cents, against 18·55 cents in 1889; 15·35 cents in 1888; 17·80 cents in 1887; 10·32 cents in 1886; 9 01 cents in 1885. It has been a year of reduced supply and high prices. At times a great disparity existed between grades, and prices ruled above the parity of exchange quotations.

The following table exhibits the stocks and distribution of coffee in 1890 as compared with 1889:—

	1890. Tons.	1889. Tons.
Stocks Jan. 1...	23,098	16,213
Imports in 1890.	201,273	222,970
Total supply 1890.	224,371	239,183
Less stock December 31...	14,914	23,098
Distribution in twelve months	209,457	216,085
Less exports in twelve months	...	...
Consumption in twelve months	209,457	216,085
„ monthly average	17,455	18,007

The December consumption was only 14,078 tons, being lighter than for any other month during the year. The maximum consumption was in April, when it reached 19,521 tons.

Of the total imports of 201,273 tons, there were 173,111 tons received at New York; 773 tons at Boston; 11,179 tons at Baltimore; 16,210 tons at New Orleans. The imports of Brazil coffee reached 152,280 tons, being 75.6 per cent. of the total imports.

Upon receipt of the figures showing the European consumption, we will present the position of the article in greater detail.—*American Grocer.*

CANNING COCONUTS.

A new industry is springing up in Brazil consequent upon the discovery of an ingenious Portuguese. He has struck the novel idea of canning coconuts in spiced syrups, and these are said to be particularly well received in Portugal, to which country consignments have already been made.—*Australasian.*

TEA ADVERTISING.

"What you think of the latest advertisement? Do you know where this *Dalu-kola* Tea Company have their offices?" This from a London merchat to us, refers to a fly leaf circular which beautifully displayed in coloured ink, runs:—

"Childwick Hall, Beckenham Road, Penge. On Monday evening, February 23rd, 1891, commencing at eight o'clock, C. S. Hicks, Esq. (of the Dalu-kola Tea Company), will give his celebrated Lecture, delivered at the People's Palace, and throughout the Provinces, on the beautiful Isle of Ceylon, magnificently illustrated by dissolving views, especially painted for the Lecture at considerable cost, and varied by Songs and Music. Chair will be taken by Bryce Grant, Esq. The Proceeds (after paying expenses) will be handed over to the Funds of the Penge and Anerley Philanthrophic Society. Cups of pure Ceylon Tea given away free by natives in their picturesque costumes. Admission by Ticket 2s, 1s, and 6d; children half-price if accompanying adults."

Whoever Mr. Hicks may be, Ceylon surely is indebted to him for advertising her teas?

THE RUBBER OUTLOOK IN BRAZIL.

Regarding the new companies forming in Brazil to control the rubber trade of the Amazon, Mr. Francis Grauert, who is popularly supposed to be connected with such an enterprise, said one day last week:

"At present there are two of these companies in Brazil, and both working in Amazon River centres now. One of them has a capital of five millions and the other twenty, both more than half paid up. There seems to be plenty of money in Brazil with which to organise such companies, as there have been very prosperous times in that country. Coffee has gone up from 7 cents to 15, which has drawn a great deal of money there. These two companies are however, now in competition and in order to obtain rubber sometimes pay more for it than is necessary. "Baron" Vinna is connected with the smaller of the two. With the capital that these companies have, they are in a position to freely advance money to the gatherers from the time they leave any of the large rubber centres on the Amazon into forests, provide for the heavy transportation charges, and carry the crop without any special anxiety until it is marketed.

"Regarding this year's crop, the Rio papers some time ago stated that the season had been a healthy one and rubber was being freely gathered. This state of affairs seems to have changed for we gather from our last mail advices, that rains began to fall in December, earlier than usual, and that sickness was prevailing among the gatherer on the islands, in consequence of which the collectors had began to retire. In the wet season malaria is prevalent, which produces chills and fever in a somewhat aggravated form. Our mail advices are confirmed by a cable of the 8th, which states that the weather is bad, receipts were falling off and that the second half of the crop would be short. We do not believe that present prices are high."—*India-Rubber World.*

BRITISH NORTH BORNEO NOTES—GENERAL.

February 1st.

At a Meeting of the Lawn Tennis Club, held at the Court House on the 13th January, Mr. Henry King Sturdee the Hon. Secretary on behalf of the Bachelors presented their Handicap prize to Mrs. A. Cook the winner. In handing the cup over, Mr. Sturdee made an appropriate speech, which Mrs. Cook acknowledged thanking the Bachelors, expressing a hope she would long keep it, as a remembrance of the Sandakan Tennis Club and the Sandakan Bachelors. Mr. Cook then invited the gentlemen and ladies present to refreshments provided for the occasion and the Meeting dispersed.

Very heavy rain set in on Thursday January 15th, and with the exception of part of Friday 16th, held continuously up to January 25th. One landslip took place on the road under the new Roman Catholic Convent. Thanks to Mr. Dunnage the main roads where he has lately repaired them have stood the heavy deluge uncommonly well, and thanks to his thorough drainage the water soon runs off, so much so that a few hours sun suffices to put them in hard condition again.

By the steamer "Memnon" which arrived from Hongkong on the 9th January, Mr. J. Robertson returned from leave, looking all the better for his sojourn in a colder climate. Mrs. Robertson accompanied him. Mr. E. F. Skertchley also returned from leave by the same opportunity.

Heavy rains have we hear fallen in the Darvel Bay District. The Tabanac river was in flood for some days, but no damage has been done to the tobacco Estates.—*British North Borneo Herald.*

PAPER *VS.* LEAD LINING FOR TEA CHESTS.

We call attention to two more letters of interest in this connection further on: first from Mr. T. C. Anderson about "Clark's Patent" paper-lead-tea lining which has the reputation of being a very superior but rather expensive article, and next from Mr. Maitland Kirwan about his paper lining. In this latter we get a very important correction on the previous information which reached us from London as well as locally respecting this paper lining. In place of costing more than lead lining as was last related by our London correspondent, the price is really only about *half that of lead lining.* This makes so great a difference to tea planters that we feel sure trials of the new paper lining will be freely made and the matter fully inquired into. The pity is that a Sub-Committee of the Planters' Association is not at once prepared to take up the enquiry and needful testing. Meantime, Mr. Anderson supplies conclusive evidence as to the superior quality of "Clark's Patent" paper-lead, and if Insurance offices charged less for tea so packed, an equality in cost with ordinary tea lead might be established?

YAMS, GRAPES, MANGOES: PRODUCTS OF NORTH CEYLON.

Mr. S. K. Lawton, the very intelligent Tamil gentleman who acts as agent for the Ceylon Steamship Co., Ltd., at Jaffna, writes to us:—

"I send per the S. S. 'Lady Gordon' leaving Jaffna this day a few samples of the food products of the North for your acceptance and trial. Whether it is attributable to its dry climate or the system of careful tillage and well irrigation the food products of Jaffna have peculiar excellence. The 'King' yam has been tried elsewhere, but the yield has been too rapid and watery to be fit for the table, while the grapes and mangoes of Jaffna have been rarely excelled. I find very little of these products are being sent to other parts of the island perhaps owing to their not being sufficiently known. With regular visits of the S. S. 'Lady Gordon' to the different ports it would pay an enterprizing Jaffna man to start a supply agency for these articles. Should a regular trade be thus stimulated the hardworking Jaffna cultivator would be able to obtain a better return for his labour than he does at present by supplying a limited local demand."

It is certainly very strange that there is not a regular trade by steamer. We heard the other day that grapes are still carried in the season by the land-route via Puttalam and Chilaw; but surely not from Jaffna? Our informant, a Chilaw planter, has told us that he notices the pingo men regularly passing and they sell at 50 cents a lb. the grapes which are 75 cents to a rupee by the time they reach Colombo. Then as regards the monster king yams and fine Jaffna mangoes—earlier in season than in Colombo,—the specimens Mr. Lawton has sent us are sufficient to show how much the Colombo markets and the Jaffna cultivator might both benefit by a trade in Northern products. Surely the hint now given will not be lost.

MINING AND GEMMING IN CEYLON.

We have already expressed our regret that the London Syndicate should follow up their most excellent first movement which brought so high an authority as Mr. Barrington Brown to our shores, with a one-sided insufficient system of working. Far better, we shoul think, to delay all operations until they were in a position to send out the expert again with the staff and machinery he might deem necessary to give due effect to his anticipations, or at any rate to develope and test on the lines of his own Report. We trust, therefore, that the members of the London Syndicate may make up their minds that it is no use expecting a satisfactory trial of our gemming and mining country by going to work after an imperfect dilettante fashion. Nothing should satisfy those concerned, but the despatch of Mr. Barrington Brown, to deal carefully and systematically with the most promising of the selected lots of land, leased or purchased on behalf of the Syndicate by his advice during his stay in Ceylon. Before securing the land in many cases, tests satisfactory to the expert were applied and it is interesting to know that some portions have been leased from the famous "Gem Notary" of Ratnapura, who is credited with having amassed altogether as much as twenty lakhs of rupees, while not less than R800,000 is the amount this prince among "gemmers" states he made out of one famous alluvial mine near the town of Ratnapura! In accompanying the expert on one of his testing expeditions, a relative of the notary showed him a spot under some huge gneiss rocks from which he had washed out R20,000 worth of sapphires. If credence is to be attached to such figures,—and Mr. Barrington Brown apparently saw no reason to doubt them,—it is very evident that there is more than a *prima facie* case available for European capitalists to induce them to deal with this Ceylon Gemming Industry.

It was only natural that the expert should at every turn see openings for the application of machinery; for instance in the case of suitable portions of river beds, a steam dredger that could take up the bottom to the depth of 10 feet, could not fail to deal with a large quantity of material, with every chance of success. Then on the higher gem diggings on hillsides and along mountain streams in Rakwana, the application of hydraulic principles and contrivances after the most improved European fashion must have, again and again, struck the expert. On Butiyatenne and Golden Grove—already secured—the Syndicate would have full opportunity for developing hillside pits. The information available as to "finds" in this neighbourhood was also very encouraging:—catseyes realizing from R1,000 to R5,000 each have been not unfrequently picked out of the washings, while, as we recently recorded, larger stones of very much greater value are occasionally found. One way of testing the returns obtained by parties of gem-diggers (all Sinhalese) in the Rakwana district, is found in the periodic sales which are held. Three pits at one of these sales gave results equal to R5,100 for seven weeks' work, and later on, one of these pits, in a similar period yielded stones which sold for over R6,000. A good sapphire, it seems, is worth £6 a carat in Ceylon.

It was surely then no wonder that Mr. Barrington Brown, after spending some months in our Gemming country, closely watching the operations of native diggers and gemmers, testing for himself and collecting all available information, came to the conclusion that quantities of valuable sapphires and true catseyes had been dug up in the gem districts of Ceylon for many years. But of far greater importance is it to know that he is of opinion that after all only *a small, if not insignificant proportion of the deposits have been worked out.* The expert, in fact, is of opinion that there are extensive gem-bearing deposits in certain of our districts and that gems of great value are undoubtedly to be found in such deposits. From the Report furnished to them, the London Syndicate must be well able to judge how far the expert thinks that the lands already secured

by them, share in the valuable deposits to which he refers. For our own part, we consider there ought to be abundant encouragement to induce capitalists to send out Mr. Barrington Brown himself with adequate staff and machinery in order to direct the needful development of a gemming industry on the lands already purchased or leased.

COCONUTS AND CINNAMON.

Kadirana, March 12th.

After three weeks of dry weather there was a good shower on the 7th and a few drizzles each evening since, aggregating 0·95 of an inch. This will help the peeling a little which is just now not good, owing perhaps to a bud now appearing. Cinnamon crops in this district will be much below the estimates on all estates. Coconut pickings are good and will probably continue so till the end of June, but from then to the end of the year they will be very small. Prices are good (R35 to R37·25 per 1,000 on the spot) and should continue so should the price of oil not fall much. Fever is prevalent in the villages.

March 13th.

Fine rain last night; measured this morning 0·69 in.

INCREASING THE SUPPLY OF FISH FOR FOOD.

The ever-increasing work of the fish commissions, state and national, gives ever-increasing cause for public gratitude. This would no doubt be more generally forthcoming were it not for the prevalence of the erroneous notion that the pleasure of sportsmen is the chief object in view. On the contrary, though the angler has his grounds for satisfaction, he is but a secondary consideration in this matter. The main purpose of fish culture is to increase the supply from this economical source of nutriment. As Professor Atwater puts it, "Fish gather materials that would otherwise be inaccessible and lost and store them in the very forms that are most deficient in the produce of the soil." The chief nutrient of fish is protein, in which most vegetables, such as wheat, rye, maize, rice, potatoes, etc., are deficient. It is needless, however, to dilate on the physiological advantages of a protein supply when everybody knows the utility and economy of fish as an article of diet. * * *

Just as trout streams through all the settled parts of the country have been fished out, so the great lakes and the adjacent parts of the ocean have been fished out. The aim of the fish commissions is to renew the supply.

This suggests the most profitable feature of fish culture—the fact that fish is the only crop that doesn't have to be cultivated. To plant and to harvest is all the work. The farms of fresh-water fish, that is to say, the rivers and streams, may be spoiled for them by the offscourings of manufacturing, but that can never happen in the great lakes and the ocean. There is still room and food for as many of them as there were when John Smith could hardly get his ship along for the cod that belabored its sides. But within the memory of living men the supply of food fish has diminished so much as to become a reason for serious alarm.

* * * *

The work of the state commissions (and most of the states now have them) has been mainly directed to the stocking of rivers and ponds, to the erection of fishways around falls and dams, and to the procuring of legislation forbidding the taking of fish during the spawning season. The work in New York, which is at least not the most backward in this respect, will serve to illustrate what is going on through all the country. In the year ending September 30, 1890, the New York commission distributed fry and eggs as follows: Brook trout, 2,699,500; lake trout, 7,476,000; brown trout, 1,246,500; frost fish, 3,320,000; sea salmon, 50,000; land-locked salmon, 18,000; white fish, 3,998,000; ciscoes, 2,400,000; smelts, 200,000; maskinonge, 75,000; California trout, 155,000; pike, 4,000,000; shad, 12,238,688; grand total, 39,844,688. As one instance of hundreds that might be cited from various parts of the country showing results already accomplished, it may be mentioned that last summer, when the fishway was put in at the Mechantville dam on the Hudson, in the shoal water created by opening the gates more than 100 salmon were counted, from one to three feet long, and probably weighing from five to thirty pounds. The largest salmon caught there by angling last season weighed twenty-two pounds, and measured thirty and one-half inches. These fish came from fry put into the Hudson seven years ago from the United States hatchery at Gold Spring, L. I. * * *

The United States commission finds its more important field in the great lakes and the ocean. At Put-in-Bay, Ohio, for example, the hatchery recently completed has a capacity of 250,000,000 white-fish eggs, and it is intended to run it to its full capacity. All the eggs are procured from the pound nets in Lake Erie, and taken from the fish that are on their way to market, and would be wasted were it not for the commission. At Wood's Holl, Mass., the most important station of the commission, the work that bids fair to be most profitable is the propagation of codfish, and the officials have strong hope of making cod again as plenty in New England waters as they were three centuries ago. This hope is based on the fact that in artifical propagation there is practically no loss, while the loss under nature's care, or rather, lack of care, is tremendous. In the natural process only a small part of the eggs become fertilized, and so many of the infant cod get devoured that probably only 1,000 or 2,000 out of 1,000,000 survive. The female cod averages 1,000,000 eggs, of which probably 950,000 can be saved in the hatchery. If the commission can furnish to the water as many fish from one cod as nature can from 10,000 or 100,000, it will not take many years to make a big impression on the cod supply. It is the same with the lobster, and with other products of the fisheries. Indeed, there is ground for expectation that ultimately fish may become our greatest and cheapest source of food.—*Bradstreet's.*

QUININE AT ITS LOWEST?—Where is the fall in price of Cinchona Bark and Quinine to stop? From the monthly report of Messrs. C. M. & C. Woodhouse, dated February 19th, by this mail we learn that

Very few transactions were reported in Quinine, which was quoted nominally at about 1s per oz. for German during the first 10 days of this month, however, some forced sales drove the price down to 10d per oz. (*the lowest price on record*); this decline attracted buyers, and a large business was done, chiefly at 10½d to 11d; latterly, again the tone has become quiet, and there are sellers at 11d. As will be seen below, the shipments of Bark from Java during December were very heavy, being estimated at about 1,250,000 lb.

Quinine at 10d and 11d per ounce! and yet we venture to say, the great majority of retail buyers, in the country districts of the United Kingdom at least, continue to pay 1d per grain or at the rate of 40s per ounce!

WATTLES: TIMBER AND FUEL TREES AND INDISCRIMINATE PLANTING.

(From the Hills.)

THE WEARY BEWILDERING WATTLES.

If, as Professor Maiden of the Sydney Technological Museum indicates, the fine, thin-leaved and small-blossomed specimen he has so courteously sent of the Sydney *Black Wattle* correctly represents the normal *Acacia decurrens*, then, I quite agree with Dr. Trimen that it has not yet been grown in Ceylon. I have grown and seen many of the Australian "wattles," but anything with such minute leaflets as Dr. Maiden's specimen of what he regards as the true *A. decurrens* has never come under my notice. On the other hand we have on Abbotsford some magnificent trees, the foliage and blossoms of which exactly agree with Dr. Maiden's specimen of the "Green Wattle," *A. decurrens*, var. *mollissima*, the prince of all the wattles for yield of tannin. Our Abbotsford trees also agree with Mr. Kellow's and the fine specimen at Hakgala. But I hope to do what Mr. Kellow suggests, take the Australian specimens and some of our own to compare with his. To a non-botanical eye the *mollissima* variety of *A. decurrens* would seem to be the type, luxuriant in leaf and blossom as it is robust of stem. Although it is not tannin but timber and firewood that we want here in Ceylon, we cannot help feeling that Baron von Mueller's *mollissima* is the variety of *decurrens* which we should grow at altitudes about 4,500 feet, for I have heard that at lower altitudes the Australian wattle shave not been a success in Ceylon. What will the Baron say to the variety about whose merits he has written in such enthusiastic terms being botanically abolished? It is beyond measure puzzling to find the Victorian botanist, whose fame is world-wide, after giving a general description of *A. decurrens*, Willdenow, *the* tan wattle, as a small or middle-sized tree, which, besides timber, "supplies excellent firewood," adding, "the typical *A. decurrens*

WITH LARGER LEAFLETS,

occurs particularly in New South Wales, rises seldom above 30 feet; it has, according to the Hon. Dr. J. Cox, a bark of less tannic strength than the tree distinguished as *A. mollissima*." So that the Victorian *A. decurrens*, probably *A. mollissima*, which we have got in Ceylon, cannot be Dr. Maiden's typical species. If by "larger leaflets," longer branchlets and spines are meant, the statement is quite correct, but with our popular conception of leaflets, those of the var. *mollissima*, certainly convey the idea of being larger because so much denser. Von Mueller also describes the seed of *mollissima* as "somewhat smaller, comparatively shorter, rounder and not so flat as those of *A. dealbata*, while the funicular appendage does not extend so far along the seeds, nor is the pod quite so broad; from those of *A. pycnantha* they differ in being shorter, thus more ovate than elliptical." In our warm moist Ceylon climate *A. decurrens*, like other Australian trees, grows more rapidly and to greater size than it generally does in its native habitat, Von Mueller gives a separate place to *A. mollissima*, and states that "most of the notes under *A. decurrens* refer more particularly to *A. mollissima*." The reason, therefore, why the *A. decurrens* grown in Ceylon is var. *mollissima*, is probably that all the seed was obtained from Melbourne. Maiden says of the normal *A. decurrens*, what is probably true of the variety we are growing in Ceylon, that even in a green state it furnishes an excellent fuel. One of the merits of *A. decurrens*, so far as my observation goes, is, that it does not send up suckers so freely from its spreading roots as other kinds do, especially that which has formed so dense a grove at the Nuwara Eliya church, and *A. dealbata*. The specimen of this latter species, the silver wattle, sent by Dr. Maiden, is doubtless, as Dr. Trimen stated, identical with the kind grown in Nuwara Eliya which so seldom flowers. It is the least beautiful of all the wattles growing on the Plain. I wish, however, that, besides seed pods, the specimen sent by Professor Maiden showed the inflorescence also, for I am now puzzled what to call the acacia, beautiful alike in stem and leaf and blossom, so flourishing near the church and elsewhere in Nuwara Eliya, and which was popularly known as

"THE GOLDEN WATTLE,"

until the exclusive title of *A. pycnantha* to that name was asserted. The truth is that many, perhaps fifty out of the three hundred or so, of acacias in Australia, bear yellow blossoms and are popularly known as "golden wattles," the flowers being used as a substitute for the "may" or white-thorn blossoms of Britain. What troubles me is the fact that the denizens of Ootacamund, on the Nilgiris, who are waging war against the over-prevalent *A. dealbata*, write of it as "the yellow wattle," a name surely more descriptive of the acacia we have mentioned as forming the grove at the church in our sanatorium, than of the silver wattle which so rarely flowers? *A. dealbata* is described by Baron von Mueller as sometimes attaining a height of 150 feet, and besides being useful as timber, serving principally as

SELECT FUEL OF GREAT HEATING QUALITY.

This would render it very valuable to tea planters, but the inhabitants of Ootacamund complain that when the trees first grown, so long ago as 1840, were cut down, the ground got filled with interlaced roots, from which there have sprung innumerable suckers, so dense in growth as to constitute an insanitary nuisance. On the occasion of a former crusade against the all prevalent and encroaching wattle the Madras *Mail* wrote of the myriads of suckers which come up with renewed vigour and amazing rapidity as fast as they are cut down, and form *an inexhaustible fuel reserve*. Col. Beddome, however, stated that although this wattle grows very readily from the stool (after being coppiced), it comes up in a dense mass of small twig like stems, so that it can only be depended on for *very small firewood*. Dwellers in Nuwara Eliya, before further extending the cultivation of *A. dealbata* and the beautiful golden-blossomed species, which sends up suckers even more readily, may well take warning by the experience of Ootacamund, where the Municipality is invoking the aid of Government to get rid of what all agree has become

AN INTOLERABLE EVIL,

while secondary and indescribably dense stems are not to be compared, so they assert, as firewood with blue-gum, original stem and coppiced. We can testify from our own experience that blue-gum coppices most readily, at almost any age, the secondary stems being even more luxuriant and healthy looking than the original trees. There is one thing to be said, however, as to the encroaching tendency of *A. dealbata* suckers,—that the soil of Nuwara Eliya is considerably poorer,—we speak of the grassy Plain—than that of Ootacamund. Dwellers in the Ceylon sanatorium are not likely, in imitation of those in the Nilgiri health resort, to pass from a perfect *furore* for planting groves of firewood trees, to a wild demand

that a clean sweep or next to that should be made of the woods which they now declare are impeding the circulation of fresh air and stifling them. Considerable space in the *South of India Observer* of Feb. 14th is occupied with the evils produced by the

INDISCRIMINATE PLANTING OF TREES

in Ootacamund. Major-General Jennings had recommended:—

(1) The restriction of all further planting of trees within Municipal limits.

(2) The gradual reduction of the existing number of trees to within a certain fixed number per acre.

(3) The extirpation of the yellow flower Acacia (*A. Dealbata.*)

(4) The gradual removal of the causes of all undergrowth.

These recommendations were unanimously agreed to by the Municipal Council, at a meeting at which

A paper by Mr. George Oakes giving a description of the Melanoxylon, the Acacia Dealbata and the Eucalyptus, and a brief account of the introduction of these trees into Ootacamund was read, and the Sub-Committee report.—

"The ground within Municipal limits is overgrown with trees to an extent detrimental to health, and incompatible with proper sanitation.

"Large areas of land are shut out from the purifying influences of the sun and wind by trees and the undergrowth from them, which give cover to decaying vegetation, and noxious matter."

"The Melanoxylon and Dealbata which are to be found growing in every direction, possess the property of extending their roots to a considerable distance, and of throwing up suckers therefrom, which in places have become dense thickets. The ground is penetrated in every direction by the roots of these trees and thickets springing up from them may be seen in course of formation on all sides."

"The examination of the ground under the surface reveals a closely interlaced network of roots. The extent to which these roots have grown, can only be realized by inspection. They are ever spreading and increasing, and there are now few spots in Ootacamund to which they have not extended."

"The Committee are of opinion that an evil of serious magnitude has resulted from the planting of the Dealbata and Melanoxylon trees within Municipal limits, and from the excess to which the planting of other trees has been carried ; and that unless special measures are adopted, and powers beyond those contained in the Municipal Act conferred on the Municipality to enable it to deal with the evil, it can neither be checked or remedied."

The Sub-Committee suggested:—

(1) "That a restriction should be placed on the further planting of trees within Municipal limits.

(2) That the existing number of trees should be gradually reduced to within a certain fixed number per acre.

(3) That the growth of the Acacia Dealbata within Municipal limits should be prohibited.

(4) That a Committee of five members nominated by Government, viz., the Collector of the District, or the Chairman of the Municipal Council, as may be deemed expedient, and of which the Medical officer of the station and Forest Officer residing at Ootacamund shall be *ex-officio* members, shall be appointed to report to, and advise the Municipal Council, on matters connected with the planting of trees within Municipal limits, and with the working of such bye-laws as may be passed on this subject.

(5) That an Inspector, to be appointed by the Chairman of the Municipal Council shall be sanctioned for such time as may be necessary to carry out the provisions of such bye-laws as may be passed.

Mr. Peet, who we suppose is the Government Commissioner or Collector, wrote a commonsense Minute on the subject, but even he demands the extirpation of *A. dealbata*, which, to our bewilderment he calls, from its flowers, no doubt, "the yellow wattle," while with us "the silver wattle" seems the more appropriate term, judging from its foliage and not by its flowers, which are, with us, so seldom seen. Mr. Peet wrote:—

"I would remark that I took the opportunity of going round with Mr. Geo. Oakes and yourself (the Chairman of the Municipal Council) to see some of the growth near the station to which attention has been drawn by the Municipal Council, and it is very clear that some remedial measures are called for, particularly with regard to the thickets of Yellow Wattle (*Acacia Dealbata*). The suggestions of the Municipal Council however go rather further than Government is likely to sanction in my opinion.

"I think that suggestion 1 might be feasible and would be advantageous, and that Government might possibly be inclined to limit future planting within Municipal limits.

"Suggestion 2 however does not strike me as practicable. Reading it with the proposed bye-law 2, which proposes that the number of trees per acre should be limited to 50, it seems to me that Government would never sanction such an interference with private property, and that there would be a very large bill for compensation. Looking at the question from a Forest point of view, I find that the following reserves are within Municipal limits, viz.:—A good part of Aramby, nearly half Snowdon, half of Dodabetta, more than one-third of Craigmore, all Elk Hill, half of Lovedale, the whole of Manjimkora, Bathai and Feru Hill, half of Cairn Hill and parts of Mathana Sholah and Fairlawns.

"Parts of the reserves mentioned are planted with exotic trees, but the greater portion is under indigenous forest growth. Most of these reserves lie at a distance from the more inhabited parts of the Settlement, but as being within Municipal limits would still come under the purview of this far reaching suggestion.

"There is another consideration namely, that trees grown in the open as a rule, branch extensively, and fifty trees put down per acre would with some species have as much effect in retarding air as 200 or more which run up as poles.

"There are numerous other difficulties which suggest themselves, not the least of which would result from a power of inquisition being given to the Municipal Council. Again there would be irritation at the power of sanctioning (under Bye-law vii.) an excess of trees in certain places, when another claimant might consider himself equally entitled to favorable consideration, and it must not be forgotten that it would be necessary in very many cases to grant such exemptions, since one of the great reasons for planting originally was to break the force of the wind which would otherwise sweep through the station.

"Dr. Cleghorn records the opinion of three doctors on the subject of tree planting on the Nilgiris, when the experiment was in its infancy, One states: 'I consider the subject to be one of great importance, both in a sanitary and economic view.' He then goes on to state that his opinion was that the larger proportion of disease at Wellington than at the neighbouring station of Coonoor is due, in a great measure to this circumstance, viz: the want of wood; as in all other respects, height, temperature, exposure, &c., there is scarcely any appreciable difference between the two places.

"I think that by planting trees judiciously great benefit would be derived, not only from the shelter they would afford, but from the good effects produced by a moderate quantity of vegetation in purifying the atmosphere!

This reminds us that when the soldiery in exposed barracks in Jamaica were suffering severely and many dying from fever, Sir Wm. Fergusson, the eminent physician, cured the evil by means of

A SHELTER BELT OF QUICK-GROWING TREES.

Mr. Peet's Minute proceeds thus:—

"The opinion of the other two doctors coincides in the main with the above. There is therefore something to be said on both sides as to the planting of trees

in high situations particularly, and the power sought by the Municipal Council in Suggestion II. and Bye-law II. does not seem to me what Government is likely to grant.

"Bye-law III. would stand or fall with Bye-law II. Bye-law IV. would be useful in many cases: but might be a dangerous instrument of annoyance. Is it not already sufficiently provided for under the present powers of the Municipality in case there is danger to be apprehended from the growth objected to?

"I think it would be useful in many cases to save people in spite of themselves, for nothing strikes one with such astonishment as the callous way in which people build or live in houses, under trees which a moderate cyclone would bring down to the entire destruction of the buildings

"Bye-law V. would be most useful if practicable. If the Municipal Council is prepared to compensate owners for eradicating yellow wattle there is not one word to urge against what would be a most useful provision. If however the Council is not prepared to give compensation I think that an order to eradicate the pest would be rather despotic. That it is a pest I agree most cordially, but I do not see that there would be much chance of getting powers from Government to do more than keep the thickets cut down at intervals.

"It might be possible to get Government to rule that no trees of yellow wattle should be planted, and even that all *trees* (as distinguished from wattle thickets) should be cut down, in order to minimize the danger of an extension of the roots. I do not think that black wattle *Acacia melanoxylon*, comes under the same category, except under very exceptional circumstances. Bye-law VI. would be useful in many cases, though even that might cause irritation."

So far Mr. Peet. To quote again:—

Mr. George Oakes in his minute remarks :—"That in 1883 the Special Sanitary officer, Surgeon-Major Nanney adopted vigorous measures for the eradication of the *Acacia Dealbata* or yellow flowering wattle, which were fairly successful, but as he was unable to legally insist on land holders clearing their land, several large areas were left to spread. The *Acacia Dealbata* appears to have been introduced some 50 years back, when owing to the scarcity of trees in the station, it was largely planted by holders of property as avenues, and to mark the boundaries of their holdings. The trees originally planted having been cut, and the roots left in the ground has led to the present dense growth of brushwood, which is as unwholesome as unsightly. As regards the value of the tree for fuel and timber, it ranks amongst the lowest of the imported Australian trees, a straight well growing tree being the exception. On these hills it seems liable to canker, which attacks the tree just at the junction of the stem and the roots, and is the cause of their suddenly falling. From the roots left in the ground thousands of suckers spring up, and continually spread. It is noticeable that these suckers seldom grow up into trees, but seem to expend their force in extending their roots, which form as dense a net-work under ground as the suckers do above. There are very dense growths of this tree at Bishopsdown, Greenway, Koodah Cottage, and at the back of the Club; but hardly any property in this station is entirely free.

"Immediate and energetic steps should be taken to eradicate the pest: stem, root and branch.

"The *Acacia Melanoxylon* grows a dense handsome tree, and is useful for fuel and timber if the trees are mature and the wood after being sawn up allowed to season. The great drawback to growing the tree, in the station, is the extent to which it throws out roots—frequently 25 to 30 yards from the trees, from which other young trees spring up which again extend their roots, it is therefore one of the worst trees to plant near buildings.

"The *Eucalyptus Globulus* was introduced subsequently to the Acacias, and is now of the three species mentioned, the only one planted to any extent. Within the last fifteen years the very extensive planting of this tree in the station in many cases 3 feet by 3 feet and within six feet of dwelling houses has had a detrimental effect on the health of the inhabitants.

"The tree in itself is most harmless and the essential oil distilled from its leaves, a most valuable addition to the Pharmacopœia; but the dense plantations of it preventing the sun from reaching the ground and the free circulation of air are inimical to the health of those residing in the vicinity. Apart from the above reasons it is noticed that any springs or wells in the vicinity are quickly dried up!

"The roots of the Eucalyptus though large and spreading and dangerous when planted too near buildings have not the habit of throwing up suckers and spreading as do the acacias. The wood is the best fuel we have and timber sawn from trees thirty years old is suitable for beams and rafters of roofs; but is of no use if subjected to damp.

"If planted in moderation by those of the residents who wish to have a few trees for shelter or fuel the Eucalyptus is the best they could plant, but they should on no account be planted closer than 20 by 30 which will give 48 trees to the acre."

I think it will occur to readers that where the object is to bind loose soil, such as road and especially railway embankments, *A. dealbata* will be of great value; while, finally, although tree planting ought to be carried on with discrimination in Nuwara Eliya, it will be very long indeed before dwellers in our Sanatorium will imitate the Ootacamundites in their complaints against too much shade and shelter from the planting of exotic trees. The bareness, rather, of many parts of the grassy Plain needs redeeming by judicious arboriculture.

HAILSTORMS IN MASKELIYIA.

March 13th.

The hailstorm on the 28th February must have been very local, or some notice would have been taken of it. I send by post some tea and cinchona leaves perforated that will give you an idea of what the force and quantity of hail that came down was. It made the dogs and fowls hop. In the back verandah half-an-inch of hail stones were on the mats, and some of the largest I have ever seen almost as large as a pigeon's egg. The noise on the shingled roof was a caution. * A few estates down the valley from here neither hail nor rain fell though it poured ("buckets") up the valley. You perceive it went clean through old and hard tea leaves. A carpenter showed me a paper umbrella that the hailstones had gone through, and I must say it looked like it. The perforated holes were from the outside and the appearance of being holed as he described.

COFFEE FROM ABOUT KORAT, SIAM.

It seems likely that a new industry will be added to the wealth of Siam, and that the cultivation and sale of coffee will become an important trade in Bankok.

The more we hear about Korat, from those who have visited that part of the country, the more we are convinced that this large area offers favourable conditions of elevation, soil and climate to open out plantations for the cultivation of the Arabica coffee berry. The culture now seems, says the *Bankok Times*, to have been superseded in Ceylon by tea, for we no longer hear any mention of coffee from the famous old plantations that for so long a time commanded the coffee marts of Europe. Thus the world's supply is diminished by the amount of the falling off from that source. Then year by year the taste for coffee has extended until it is no longer looked upon as an article of great

* The leaves—large ones too—are completely riddled with holes as if shot through. We are fortunate in Ceylon in having a visitation of this kind, so much less often than tea planters in North India.—Ed, *T. A.*

luxury, but is now classed among the necessities of life. Hence notwithstanding that consumption increases, production has not kept pace with it. The supply now is therefore not equal to the demand, nor can it be expected to overtake the consuming powers of the world's population even under a vastly increased production for the next two decades of time. The outlook therefore is very favourable for the planter as regards a market.

In casting about for new lands possessing all the eligible advantages of aspect and situation, with the essential conditions of temperature and humidity, we can confidently invite his attention to the newly opened up table lands approaching Korat. We are told that, on these table lands the surface formation is of a rich friable loam, with a deep sub-soil, that cracks and opens with the sun in the dry weather; and that it varies in colour from dark brown or chocolate to a reddish yellow according to locality, the former indicating the presence of humus and the latter oxide of iron. Indication of the presence of the mineral ingredients is highly favourable in soils for the cultivation of the coffee berry, as showing a soil less burdened with insect life, and the vegetation less liable to attack from insects. It is also asserted that the railway will pass over country of this character. having an elevation of 1,200 to 1,300 feet for a distance of over fifty miles.

Here the direct communication, which the railway will secure, places all the obstacles of accessibility which generally impede plantation enterprise by Europeans in eastern countries, out of the question; and at once makes easy the way for selecting a suitable strip where operations may be commenced at once. Two conditions which face the planters at the outset are difficulties of access and the preliminary surface examination of a jungle covered country. The railway here sweeps away all obstacles involved in the former and aids in facilitating the latter by placing the planter at any spot along the whole line, obviating all delays in procuring supplies and the conveyance of plant and material, cooly labour, &c. And in respect to cooly labour for any kind of agricultural operations in Siam no great trouble need be feared, and for the cultivation we are now considering there is every probablity that all the labour required can be procured in the country abundantly. Indeed, the cultivation of coffee Arabica would work in so well in this country as to give employment to a large amount of labour which is not now in demand for more than half the year. The coffee plant being raised in nurseries and transplanted out when attaining to nearly six months old, would naturally be sown just after harvest and be ready to plant out in April with the commencement of the early rains. Meanwhile the land would be cleared and prepared ready to receive the young trees before the breaking up of the land for paddy in May. Hitherto coffee has only been cultivated in a small way by native cultivators but sufficiently extensive and over a succeeding number of years, to satisfactorily prove its capabilities both in respect to soil and climate; it seems, therefore, that were the cultivation entered upon by the skilful planters who proceed systematically, enlarging their fields year by year, coffee growing would be found to provide an additional source of labour without greatly increasing the demand, whereby its price would not be rendered any more costly to general employer, and at the same time Siam might hope, in time, to be included among the coffee-producing countries of the world.—*British Manufacturer.*

RHEA IN CHINA.

A paper on 'The Cultivation and Preparation of Rhea in China' by Mr. Hosie, H. B. M.'s Consul at Wenchau, was forwarded by the Director of the Department of Land Records and Agriculture, Bengal, with an enclosure from the Government of India. The opinion of the Society was asked whether the renewal of efforts on the part of Government, to introduce the Rhea industry, is required or likely to produce practical results; the reply sent is given below. Mr Hosie's paper on the extraction and preparation of Rhea fibre applies more especially to Western China, and to the Province of Chêkiang, and deals but slightly with the Central Provinces where the bulk of China grass is grown.

The cultivation of Rhea is referred to in works written before the Christian era, and from these early records downwards there are numerous references to the subject. Mr. Hosie gives an original translation of an article in the *The Nung-Chêng ch-üan shee* or complete treatise on Agriculture, published in 1640, not having M. Stanislas Julien's translation to refer to (M. Julien's translation was re-printed in the Society's Journal in 1850). The treatise gives what may be called the standard system and Mr. Hosie's object is to show how the practise differs from this in the Province with which he deals. His notes treat of (i) Soil and climate; (ii) Cultivation of the plant; (iii) Harvesting the crop; (iv) Extraction of the fibre; (v) General: and very full Meteorological Tables are attached by way of appendix. In section (iv) of his notes Mr. Hosie makes the following interesting statements:—"I can confidently assert that a Chinaman can extract fibre from the peel, at the rate of 12½ ounces an hour. There is no cleaning required: the fibre is cleaned in the process of extraction. I give the results of my experiments. A bundle of peel collected from one hundred stems in fifteen minutes, weighed 3½ lb.; after being steeped in the tub of water for some time, it was taken out and found to weigh 4½ lb. The workman at once commenced upon it and in thirty minutes extracted the fibre, which, in its wet state, weighed 1¼ lb. It was then hung over bamboos in the open air and left to dry for six hours, when it weighed 6¼ ounces. A similar bundle of peel produced exactly the same result. Working ten hours a day, therefore, one man can produce 125 ounces, or nearly eight pounds of fibre ready for the market, in a day. As a matter of fact, the workman told me that he could extract eight catties or 10⅔ pounds a day; but I prefer to give eight pounds as a maximum.

Mr. Hosie then enters into some calculations as to the probable outturn per acre. He estimates, from repeated measurements and calculations, that a crop of 80,000 stems can be reckoned per acre giving, on the data shewn above 312½ lb. of dry fibre. As three crops are cut annually, Mr. Hosie considers that the outturn may be held at under 937½ lb.; the third crop being inferior in produce to the two others.

Mr. Hosie's paper will appear in the Journal, Part I, Vol IX.

The following is an extract from the Society's letter to the Director of Agriculture, Bengal, in reference to Government taking further steps to introduce the Rhea industry:—

The Director,

Department of Land Records and Agriculture.

Sir,—I have the honour, by direction of my Committee, to refer to your office memorandum No. 2153 (Agricultural), Proceedings in Original Revenue Department, Bengal, No. $\frac{3}{2}\frac{2}{6}\frac{1}{3}\frac{0}{}$ (Mis. F.), dated 8th September 1890, with enclosure, regarding the Rhea plant in China.

2. In my letter, dated the 27th November, I had the honor to state that the Society would have pleasure in publishing Mr. Hosie's interesting report in the next issue of the Journal, and asked that some time might be allowed for the Society to make inquiries before replying to the last paragraph of the Government of India's letter, which formed one of the enclosures, *viz.*, whether a renewal of the efforts on the part of Government to introduce the Rhea industry is required, or likely to give practical results.

3. I am directed to say that the Council of this Society are of opinion that little benefit is likely to result from a renewal of Government efforts in the direction indicated. The Council consider that it is already so widely known that the cultivation of Rhea offers no difficulties, that it is needless to take further steps to prove this; and as regards the offer of Prizes for machines, which can prepare the fibre cheaply and efficaciously the form which Government encouragement has

taken heretofore), the Council are of opinion that should a really useful and practical machine be invented, that the inventor would find it more to his advantage to patent the machine and place it before the public, rather than to claim the Government award, which, unless made an unusually large one, would not be commensurate with the advantages the inventor would then be called upon to resign.

4. From the inquiries made by one of their number during a recent visit to England, the Council have reason to believe that the demand for Rhea fibre for superior purposes is still very limited, and the manufacturers prefer to buy the fibre in its roughest state, rather than clean, their profit being derived from cleaning and working this up into thread, between the price of which and clean fibre there is but a small margin.

5. As regards further inquiries into the systems followed in various parts of China, the Council desire me to say that Mr. Hosie's report seems to afford all the information which can be desired, and would indicate that, though the systems may differ locally from the standard, there is not enough encouragement in what is now known of that, to warrant their recommending any large expenditure in acquiring further information.—*From Proceedings of the Agricultural and Horticultural Society of India.*

THE COCOA BEETLE.

His Excellency Sir W. H. Hutchinson has, it is said' appointed a Commission to enquire into the circumstances of the ravages of the Cocoa Beetle, "probably one or more kinds of longicorn Beetles undetermined," the same as we have here. The Grenada *Chronicle* says that "acres and acres of trees chiefly of young growth have already fallen victims to it and many more are threatened." The plan they have found effectual is the same that we commonly use, and consists in employing numbers of young boys and girls who dig out the larvæ from under the bark. The *Chronicle* adds:—

"Unless it is employed generally, however, by every planter and manager it will not be of much avail, for as fast as one destroys the grub on his property the full grown insect produced and nurtured in the fields of his less careful neighbours, will attack his trees and keep up a supply of grubs. United effort on the part of the planting body of our island is therefore absolutely necessary, if a foe that threatens to be desperate is to be suppressed ere it assumes uncontrollable power."

The difficulties with the Cocoa Beetle therefore in Greneda are similar to our own with regard to the Parasol Ant. One thing is certain with regard to this pest, and that is very consoling; the Beetles almost invariably confine their attention to trees 3 or 4 years old. In the last number of *Timehri* Mr. Elivan Prag reports on the destructive qualities of some minute Scolytid Beetle which have been known only to attack Cocoa plants within the last year, but which, he says have been the cause of death to the plants over a very considerable area of plantations. Mr. C. Waterhouse of the British Museum of Natural History determines them as *Xyleborus perforans.—Trinidad Agricultural Record.*

UVA NORTH-WEST, Feb. 28th.—This has been a most abnormal season—a very mild, warm N.-E. monsoon. Jan. fine; but first 18 days of Feb. rain every day, 9 inches. old, misty weather since; dry, thin wind, cold. Thermometer seldom went below 60° and as seldom exceeded 70°. A deal of the coffee crop is early but a very ugly sample. Early pruned tea has flushed fairly well, but unpruned shut up. It has been a good season for new clearings, and few supplies should be required. Sinhalese &c. doing their best to get hold of some of our coffee, but our own coolies being the chief thieves they are hard to catch at it; they watch Durai and the watchman! Glad to see some find grevillea shade stops green bug; but it is not so in my experience. Coffee wants to die out.

ARTIFICIAL FERTILISATION OF CINCHONA FLOWERS.—A Mr. J. Bosch has recently suggested a process for the artificial fertilisation of cinchona flowers, which is attracting a great deal of attention in Java, so much so that the Dutch Indian Government have appointed a commission to investigate the process, and report as to the results.—*Chemist and Druggist.*

SOUTHERN INDIAN INDUSTRIES.—The Mysore Government has granted a concession to Mr. W. F. Peter Hay, of Hunsur, of the exclusive right to manufacture sandal oil within the Mysore State for a period of ten years from the date of commencing distillation, subject to certain conditions. A royalty of 3·25 pie per oz. weight of oil manufactured and issued is to be paid to Government once in three months. The concession is conditional upon work being stated within one year.—*Indian Engineer,* Feb. 28th.

"AMHERSTIA NOBILIS."—This splendid leguminous tree is reported to have been seen in flower within the past few days, in the Museum grounds—a very unusual experience in Colombo. It flowers in Peradeniya, but scarcely matures any seed. We quote from the *Treasury of Botany* as follows:—

Amherstia. A genus of the Pea family (*Leguminosæ*), named in honour of the Countess Amherst. *A. nobilis* is the only species. It grows near Martaban, in the Malayan peninsula, and attains a height of about forty feet. When in flower, it is said to be 'one of the most superb objects imaginable, unrivalled in India or in any other part of the world.' The leaves are equally pinnate, large, and, when young, of a pale purple colour. 'The flowers are large, scentless, and of a bright vermilion colour, diversified with three yellow spots, and disposed in gigantic ovate pendulous bunches.' The tree is cultivated in some of the larger English gardens; but requiring so much space is seldom met with in collections. The Burmese name of the plant is *Thoca,* and handfuls of the flowers are offered before the images of Buddha.

SALT FOR AGRICULTURAL PURPOSES.—We have a great deal of sympathy with the object which a correspondent has in view in the letter (see "B.") addressed to us on this subject The efforts made a good many years ago, by the Planters' Association to get the Ceylon Government to agree to allow salt be used, free of duty, as a manure, were very persistent and forcible. Nor did the Government of the day refuse attention: on the contrary a whole series of experiments were made with the view of seeing how salt could be so mixed and adulterated as to make unfit for human food, while still useful for agricultural purposes. But success in their experiments was not attained. We always felt, however, that the standard fixed was a too stringent one. Practically, we cannot conceive that any estate coolies or other of the lowest of the people would have tried for a moment to utilise for food, some of the manure mixtures then tested. But the Government refused to run the risk and so with superabundant stores of salt available, none can be used as manure, however beneficial it may be demonstrated by "B." and others to be. For this reason, even more than on account of the tax on food, we should like to see the Government monopoly of salt removed. We do not believe any hardship is involved by the tax on the people so far as the condiment is concerned; on the contrary in remote districts we feel sure the poorest of the natives have salt made available to them at far cheaper rates than if, without tax, the distribution were left to private enterprise. But it is certainly very hard that such a tax should prevent salt now lying idle, being utilised in agriculture where its application is desirable.

Correspondence.

To the Editor.

LINING FOR TEA CHESTS: MR. MAITLAND KIRWAN'S PAPER: VERY LOW PRICES.

London, E. C., Feb. 19th.

Dear Sir,—I notice from certain correspondence in your *Overland* edition that some misconception has arisen as regards the price of my new tea paper, and I fear I myself may have been to blame for this mistake in not showing sufficiently clearly the price of the paper alone apart from the chest. Let me now explain clearly that the paper itself, sufficient to line a 100 lb. chest, costs 8d, say *eightpence*, f.o.b. London, as against say 1s 3½d cost of lead. The paper is supplied in three pieces, one to go round the chest measuring 28 by 87 inches, and the other two for top and bottom, measuring each 17″ by 12″. A further consignment leaves next week and can be procured from my agents in Colombo. Will you kindly give this letter publication in your next edition.—Yours faithfully,

J. M. MAITLAND KIRWAN.

P. S.—Planters desirous of trying the paper can be supplied with sufficient for a small consignment free of charge.—J. M. M. K.

WOODCOCK IN THE FORESTS OF THE EASTERN LOWCOUNTRY OF CEYLON.

Trincomalee, March 4.

Sir,—Noting your correspondent "B. L.'s" letter regarding woodcock in Ceylon, I may mention that I flushed one in Nov. last, a few miles off the Mahaweliganga, in the forest of Tambalagam Pattu about 10 miles inland. I saw it clearly, as it flew off from near my feet, and it was not the wood snipe. A jack snipe was shot at Kantalay a few years ago by Mr. Colls, P. W. D., and the range of our Scolopacidæ probably varies greatly in special seasons.

H. N.

CACAO CULTIVATION IN CEYLON: MR. J. H. BARBER'S EXPERIENCE.

Colombo, March 5th.

Dear Sir,—The enclosed letter from my agents Messrs. W. H. Davies & Co., coming so soon after your publication of Dr. Trimen's letter to the Colonial Secretary, may be of interest to cacao growers.

Throughout the last season my agents dealt with criollo or Caracas alone, from my properties near Kandy. But last week I sent them a small consignment from the grove Ukuwela which is planted entirely with the "Forastero" varieties. You will see that, although they obtained the same price for the one variety as for the other, yet those most interested in the trade, and therefore best qualified to speak to the market value of the respective varieties, are far from inclined to come to a decision on their intrinsic qualities and claims, from the mere prices obtained for them just now, as Dr. Trimen has done. In fact they seem to think very differently.

I have also to touch on another point advanced by the writer. There is a paragraph in Dr. Trimen's letter raising a doubt regarding Mr. Morris's statement that Ceylon is indebted to the Dutch for the introduction of the Criollo cacao. It may be interesting to have more light thrown on this point. For instance the reasons for the statement of the one and the arguments for the doubts raised by the other. Both are so well qualified to enter into the investigation that it would be a pity to let the matter rest in doubt. As regards one of the statements however made by the latter, that the earliest record to hand dates so late as 1819, *i.e.*, twenty years or so after British occupation, there is this much to be said, that when the British came in, it did not follow that the Dutch vacated the island. So that the island was not solely populated by the British and the natives. Nor could we trace back the date of the introduction or planting from the date of the existence of a tree, so as to say with justice or truth, "I believe it to have been then quite recently introduced." We are talking in 1890 or 1891 of a tree said to have existed in 1819. Who can undertake to say without further evidence on the point, which certainly has not been placed before the public, that the tree referred to was not 20 years old then, and the cacao, after it has attained maturity, is of all trees one about whose age there might be much speculation without certainty. What may be worth inquiring would be as to how much the British nation was interested in the cultivation of the cacao plant in other colonies in the first and second decade of the XIXth century, so as to have known its value as an industry. It may be also germane to the issue to ascertain whether cocoa was esteemed as a beverage in Great Britain, about that time, or whether it was purely a Continental drink.

The names Criollo, Forastero, &c. point to the adoption of the plant by the Portuguese; and when we remember the fact of the Portuguese having been in Ceylon before the Dutch, we can account for the knowledge in Ceylon of the value of the plant even in those early times.—Yours truly,

JAS. H. BARBER.

Colombo, March 5th.

J. H. Barber, Esq , Kandy.

Dear Sir,—We beg to advice having sold your parcels of Forastero and Caracas cocoa, from Ukuwala and Kandy respectively, at R63 per cwt. We may point out to you that Caracas is most preferred by London buyers on account of its superior quality, though Forastero is occasionally sold at good prices, as in the present instance, owing to its fine *appearance*. We are, however, informed by those most interested in the trade, that the latter would not fetch anything like the price of Caracas if shipped in large quantities. Kindly note this.—Yours faithfully, W. H. Davies & Co.

CLARKE'S PATENT PAPER LEAD LINING.

Gartmore, Maskeliya, March 9th.

Dear Sir,—Perhaps the best testimony in favor of "Clarke's Patent" Paper Lead Lining for tea chests as yet received, is the following:—A break of 7,000 lb. of Arslena tea packed in this lining was shipped in the "Nepaul." It was considered like the other lots of tea to be so damaged that the Insurance Company paid up the full amount of the insurance. I now learn from Messrs. Gow, Wilson & Stanton, that the tea, after examination, was fit for sale, and that they sold it on behalf of Insurance Company for 1s per lb. B. Pekoe, 10½d Pekoe, and 7¼d Dust.

Your London correspondent's friend is mistaken in saying a planter had complained of the excessive cost of "Clarke's Patent" Lining. I have always said it was *necessarily* dearer than lead alone, but the cost is only a few cents more per chest.—Yours truly, T. C. ANDERSON.

CACAO CULTIVATION.

Kandy, March 13th.

DEAR SIR,—In the Report of the Director of the Ceylon Botanic Gardens for 1890 there seems to be an error as regards the export of cocoa, the figures for 1889 being quoted as those of last year.

The figures given by the Chamber of Commerce may, I suppose, be taken as fairly accurate:—

1889	.. .. cwt.	19 054
1890	.. .. ,,	15,981
Decrease	,,	3,075

This result hardly supports the statement that the industry here may be considered to be in a satisfactory and improving condition.

If the Director had moved as freely amongst the villagers as an "Ideal Planter," he would long ago have fully understood why they have taken so little advantage of his gratis distribution of seeds. The more enterprising natives who went in for cultivating a few cacao trees could, as a rule, obtain all the seed they wanted from the nearest estate, without the trouble of asking for it; while others have usually been able to obtain a few bushels at any time, in the same way, for the mere trouble of picking.—Yours faithfully, PRÆDIAL PROGRESS.

[Still, villagers in Kegalla and throughout Sabaragamuwa generally can scarcely be guilty of the thefts in the Kurunegala district? The export in 1888 was equal to 13,159 cwt. so that taking the three years, we have not done so badly; perhaps cacao is to distinguish itself by alternate big and average crops.—ED. *T. A.*]

JAVA SUGAR PALM.

Matale, March 13th.

DEAR SIR,—A "gumpty palm" or as some call it the Java sugar palm had flowered and I got the sap drawn from it same as we do with the kitul, cocoanut or palmirah flower, but the result has been very unsatisfactory. Compared with our sweet-toddy, its taste is like dirty tank water. Boiled down to a sixteenth, it was like an infusion of cinchona bark. Is any of your readers able to tell us how the sugar is obtained and whether the sap could be drawn sweet. —Yours faithfully, A. VAN STARREX.

CACAO of the Forastero description is, we learn, being planted both in the Negombo and Kalutara districts under the advice of an experienced planter and with the object of giving it a fair trial

A GUM-PRODUCING PLANT.—In the last part of the *Icones Plantarum* is an account of Eucommia ulmoides, a most singular Chinese plant, as yet but little known to botanists, and the true affinity of which has yet to be discovered. "The most singular feature about the plant," we read, "is the extraordinary abundance of an elastic gum in all the younger tissues—excepting, perhaps, the wood proper—in the bark (in the usual sense of the word), the leaves and petioles, and pericarp; any of these snapped across, and the parts drawn asunder, exhibit the silvery sheen of innumerable threads of this gum." The trees are raised from seed by the Chinese (Patung and Szechwan are districts named), and when sufficiently grown, are felled, and the bark taken off. To this the natives attribute wonderful medicinal properties, the value of which has yet to be proved by Europeans. Patterns were formerly made from the wood, and the young leaves are sometimes eaten. It is hoped that at no very distant date a fresh supply of specimens will be obtained, which will enable those interested in this wonderful plant to prosecute their researches still further. It is to Dr, Henry that we owe what little we know of this important plant.—*Gardeners' Chronicle.*

"CRIOLLO" AND "FORESTERO" are not Portuguese words, as Mr. J. H. Barber seems to think, but Spanish, meaning simply "indigenous" and "exotic" (literally "home-bred" and "foreign). Any theory, therefore, as to the introduction of cacao into Ceylon by the Portuguese, founded on the use of these words, is untenable.—*Cor.*

TEA IN UDAPUSSELLAWA is described by a gentleman who has recently travelled for 22miles along the district road from Nuwara Eliya, as veryfine: from the 6th to the 13th mile out, there are perhaps no finer sheets of tea in the island, he thinks, than are to be seen in this splendid undulating upland district.

AT A RECENT MEETING of the Académie des Sciences, Paris, M. Charles Naudin read a paper on the Eucalyptus tree, which contained some interesting observations. He began by remarking that owing to the peculiar tendency of this tree to change with age or climate and to produce crosses, there was only one good work on the subject—namely, the monography of Mr. Ferdinand Müller,* of Melbourne. M. Naudin has made a study of the eucalyptus as transplanted into Europe. At Thuret, near Antibes, in Provence, there is one of the finest collections of the tree in Europe. It comprises eighty species, or about half the total number known to exist. The gum tree was originally confined to Australia and the islands in geographical relation with it. M. Naudin thanks that allits varieties have been derived from a single prototype subsequently to the separation of Australia from the Asiatic continent. But the tree has a great practical value, as it grows rapidly, and furnishes excellent wood for construction or fuel. M. Naudin thinks that all the Southern countries of Europe would profit by its cultivation, and thet, above all, the tree may be a boon in the Transediterranean colonies of France and the roads and settlements of the Sahara and Central Africa.—*Globe.*

SNAKE-VENOM.—Dr. Lauder Brunton has communicated to the *British Medical Journal* a note on snake-venom and its antidotes, in which he reviews the work which has been done to determine the nature of the active principle of venom. Very little that is certain is known about it but probably the substance is an albumose, although globulins also appear to have something to do with the action. For instance, the venom of the crotalidæ contains a comparatively large amount of globulins, and produces local swelling and blackening of the parts, while that of the cobra contains comparatively little globulin, and has little local action. The globulins and albumoses in different venoms are probably not altogether identical, for the albumose of the cobra seems to have a greater power to produce convulsions than that of the rattlesnake. It would appear that there is some resemblance between snake-venom and the albuminoid products of the anthrax bacillus, which like the albumoses of snake-poison, produce much local œdema, sluggishness, coma, and death Like the venom albumose, its activity is lessened but not destroyed, by boiling. But, in addition to these substances, Dr. Sydney Martin has obtained an alkaloid which has the same action as the albumose, but much more powerful, and this alkaloid, he thinks, is present in a nascent condition in the albumose, and is separated from it by the tissues of the living animal into which it has been introduced. As to the remedies for snake-bite Dr. Brunton seems inclined to pin his faith to the subcutaneous injection of strychnine in small and repeated doses, whisky or brandy being simultaneously administered.—*Chemist and Druggist.*

* Such is fame! The gentleman referred to is Baron Sir Ferdinand von Mueller, K.C.M.G, F.R.S., &c.—ED. *T. A.*

THE SILVER POOL IN NEW YORK.—A telegram from New York in *The Times* announces the break-down of the American Silver Pool. It says: By the defeat of the Free Coinage Bill, the great silver speculation in Wall Street has ended. Millions were lost in the "deal." Last July, when it was thought that the Bill providing for the purchase by the Government of 4,500,000 ounces of silver a month would pass, pools were made up to buy bullion in expectation of a great advance. The conclusion was correct. When the pools began operations, silver was a dollar an ounce. On the passage of the Bill, it jumped to 1 dol. 21¼ cents. To make the silver in a dollar worth a dollar in gold it would have to be quoted 1 dol. 29 cents. The men in the pool expected the rise to go to 1 dol. 25 cents, as the law was to go into effect in August. The calculated production of the American mines for the ensuing year would be 65,000,000 ounces. Of this, the Government would be required to purchase 54,000,000 ounces. The arts would use 9,000.000 ounces, and the surplus was reckoned at 2,000.000 ounces. America had previously been a heavy exporter. The pools conducted their negotiations entirely in New York.—*H. and C. Mail*, Feb 27th.

WOOD IN FIRE.—Wood cannot be rendered incombustible, or more strictly speaking, non-alterable by heat; but its non inflammability may, to a considerable extent be insured, so as to prevent buildings from a limited and temporary fire at any rate until assistance arrives. It is, however, hopeless to expect a building encumbered with inflammable substances to pass through such a test uninjured. The methods of preserving wood against fire are of two kinds; the injections of saline solution and the application of a paint or coating. The former appears but little practical; and, indeed, short of proof to the contrary, it must be considered dangerous in the case of wood of large dimensions. This system is, however, applicable to small pieces of wood. Of all the substances recommended, a concentrated solution of phosphate of ammonia is undoubtedly the best, the use of this substance, notwithstanding its high price possessing such great advantages that it should be employed in all cases where expense is no object. In the majority of cases, however, coating with brush is the only practical solution of the question, and the Ghent professors recommend as the substance suitable for use in this manner, cyanide of potassium and asbestos paint.—*Professors Bondi and Denny, of Ghent University.—Indian Engineer.*

FERROID, A NEW ARTIFICIAL STONE.—Under this title Mr. Herman Poole describes in the *Journal of the Association of Engineering Societies* a new artificial stone, which is a compound, partly chemical and partly mechanical, of iron, sulphur, and silicon with more or less foreign matter. It is mainly a super saturated solution of iron in the sulphur with the silica acting as a binder and hardener. Its normal colour is a dark slate, varying somewhat with the manner in which it is dressed, but the colour can be somewhat modified by the introduction of pigments. Successful imitations of various coloured brick and sandstone have been made. It is about the hardness of ordinary bluestone, and can be worked by the usual stone-cutting tools turned in a lathe, or planed. The tensile strength is from 650lb to 1,200lb. per square inch and under compression it endures from 9,000lb to 12,000lb. Its specific gravity is about 2·6. It melts at about 300 deg. F. very slowly. It does not deteriorate under exposure to the weather. As it can be melted and moulded, it is applicable to a great variety of uses to which stone cannot be put, and particularly so for large castings, such as pipes for sewage, &c. Architectural forms can be very conveniently made from it in position if needed. For culverts and bridge foundations the perfect smoothness of which the surface is susceptible is advantageous in lessening water friction.—*Indian Engineer.*

NEW NICKEL MINES.—It is reported that quite an extraordinary discovery of nickel has been made quite recently in Nevada. Among those best informed it is spoken of as "a wonderful development," and this representation is supported by the exhibit of masses of ore. It is claimed that the nickel is found in deposits almost limitless and of such richness that even what is termed the lowest grade yields 8 to 12 per cent. of pure metal. Quantities aggregating hundreds of tons are in sight, which give by analysis from 20 to 35·4 per cent. of ingot metal.—*American Mail.*

COOLIES AND INDIAN TEA.—So far as the Chairman's address to the Indian Tea Association in Calcutta went to show, the coolie difficulty is becoming more pressing than ever to tea plantations. Not only has the increase of acreage under cultivation tended to send up the price of labour, but the new railway and mining enterprises in the District of Chota Nagpur have diverted a large number of coolies. In Ranchi and Purulia as much as R150 a head has been offered for coolies. The District of Ganjam has turned out to be a failure as a recruiting ground. There has however been a constant and rapid increase in the total acreage under tea.—*M. Mail*, March 9.

INCREASING CONSUMPTION OF TEA, COFFEE AND COCOA.—Strong evidence of the advance of the "wave of temperance" and the general increase in the consumption of non-alcoholic drinks of late years, is given in a carefully-compiled table just prepared by Sir Henry Peek. The figures refer to tea, coffee and cocoa, and they embrace a period of fifty years—that is from 1840 to 1890—being the average consumption per head of the population as shown for each year since 1840. The most remarkable progress is to be noted in the consumption of tea. In 1840 the tea consumed was 1·22 lb. per head, in 1850 it was 1·86 lb., in 1860 2·67 lb., in 1870 3·81 lb., in 1880 4·57 lb. and in 1890 5·07 lb. In 1840 the population was 26,487,026 and in 1890 38,227,321. In respect to coffee, the consumption was in 1840 1·08 lb. per head of the population, in 1850 it was 1·13 lb., in 1860 1·23 lb., in 1870 ·98 lb., in 1880 ·92lb., and in 1890 ·75lb. Of cocoa the average consumption per head of the population was in 1840 ·08lb., in 1850 ·11lb., in 1860 ·11 lb., in 1870 ·20 lb., in 1880 ·30 lb., and in 1890 ·53 lb. Of these three articles together, their total consumption per head of the population was in 1840 2·38 lb., and in 1890 6·35 lb. The chief augmentation has been in tea, which has vastly advanced in popularity in this country.

THE ALLIGATOR AS A COMMERCIAL COMMODITY.—Besides the hides of the alligator, of which 50,000 or 60,000 are annually utilised in the United States there are other commercial products obtained. The teeth, which are round, white, and conical, and as long as two joints of an average finger, are mounted with gold or silver, and used for jewellery, trinkets, and for teething babies to play with. They are also carved into a variety of forms such as whistles, buttons, and cane handles. This industry is carried on principally in Florida. Among Chinese druggists there is a great demand for alligators' teeth, which are said to be powdered and administered as a remedy. As much as a dollar apiece is paid by them for fine teeth. All the teeth of the alligator are of the class of conical tusks, with no cutting or grinding apparatus, and hence the animal is forced to feed chiefly on carrion, which is ready prepared for his digestion. Other commercial products of the alligator are the oil and musk pods. The tail of an alligator of twelve feet in length, on boiling, furnishes from fifty to seventy pints of excellent oil, which, in Brazil, is used for lighting and in medicine. The oil has has been recommended for the cure of quite a variety of diseases. It has a high reputation among the swampers as a remedy for rheumatism, being given both inwardly and outwardly.—*Public Opinion.*

THE CEYLON PLANTING DISTRICTS GENERALLY.

TEA AND TEA PROSPECTS—"NEXT YEAR" AT LAST—11D A GOOD AVERAGE WITH LOW EXCHANGE—TIMBER TREE GROWING—FUEL AND MANA GRASS—TEA TRANSPORT AND THE RAILWAY EXTENSION AND OPENING UPCOUNTRY—LABOUR—MANURES—FREIGHTS COFFEE—CINCHONA.

(By a Planting Visitor after some years' absence.)

I note with pleasure most marked improvement and progress everywhere in tea and tea prospects, and I have not the slightest hesitation in saying, that I consider the prospects of Ceylon as a tea-producing country have improved during the last two years by 20 per cent and most estates have individually so increased in value. Prospective estimates of some years ago, made by very capable men (such as Mr. Rutherford) have proved, so far as yield goes, far from correct. Upcountry estates more particularly have given, and will give, far larger returns per acre than even the most sanguine could have expected. To Ceylon, I think, the long-looked-for "Next Year" has at last come; and I see no reason to fear its departure for many a day, but let us "ca' canny"! Everywhere not only better but good times are apparent; money is being freely offered at low rates (may planters not be led away by such commissions and many etceteras follow; fortunes are seldom made on borrowed capital, while small savings are often lost), estates are changing hands at high figures, folks are going home by the dozen, forgotten furlough circulars from several Companies are being reissued, salaries raised, and liberal commissions given. All this is as it should be, times justify it, and deserving men are remunerated in a measure for the dark days Ceylon has passed through, let us hope for ever.

For some years to come it will not be for our interests to see Ceylon teas averaging more than 11d. High prices will curtail its spreading into channels where it is at present unknown, and 11d, with present exchange ought to be the height of our ambition for a time. I think we shall always find a sympathy between exchange and prices. Uudoubtedly at present there is such.

I rejoice to see timber trees being introduced into our tea districts to the extent they are, as not only supplying a want too keenly felt, but with the object of breaking up large areas of one product, and so distributing disease as brought on by insect life in a tropical country like Ceylon. I trust, on another visit, to note the length and breadth of Ceylon's tea districts well covered with timber and fuel trees. Fuel is undoubtedly becoming a serious consideration to many estates. I wonder mana grass is not utilized as a heat generator. I feel pretty certain that in time, compressed blocks, composed of mana grass with something else, say a little tar, will be introduced as a fuel, and I see no reason why it should not be so. Why does that dead-and-alive Government of ours not offer some handsome reward for the introduction of a substitute for wood, as a fuel for tea factories?* Compressed mana grass has been tried as a substitute for boards for tea boxes; was successful so far as to show it could be compressed, and if so I doubt not it would burn well. Any quantity of the article could be grown in the island.

Tea lead will find a substitute shortly I doubt not; the sooner the better. I have long had an idea that our teas could successfully be transported in specially made air-tight bags, from the firing machine on the estate to central packing and sorting factories, sufficiently removed from Colombo as to be away from the sea air. The saving thus in transport of packing materials would be immense, to say nothing of innumerable other expenses. At present, with up and down rail rates, we pay on the packing materials about 50 per cent of what the net tea costs us to transport to Colombo. Teas in properly packed airtight bags would not, I think, suffer either in quality or by being broken into dust, even on so badly a worked railway as Ceylon can boast of Railway extension from Nanuoya seems to make progress Government has apparently laid down that land above a certain elevation is not to be opened up. A railway is constructed on such land, and so the principle that a railway is to *open up* a country disappears. We are always learning something!

Labor seems by no means too plentiful. Our Government always manages to put some spoke in the planter's wheel to retard his complete progress and the success of the Colony.

Freights seem at present higher and scarce; among other useful works of the C. P. Association, some enterprising line of steamers might be approached with the view of dealing with Ceylon teas exclusively, and not leave us to take "what is left," in the way of room.—Results from *Manuring* of tea estates seem so far a success. If labor be plentiful, tea prices and exchange as at present and certain obnoxious manures such as coconut poonac be avoided, the investment is sound.

Of good old *Coffee*, I have seen little; it will be grown again in the island some day, but not I fear successfully till the present specimen has died out, and its bones and disease rotted away.—*Cinchona* has disappeared in two years in a marvellous manner, certainly 50 per cent, and the self-sown plants are not there as they used to be. If the tree will grow, it is no bad investment to grow it, but stocks of quinine are very heavy in London and the Continent, and though constan ly changing hands are not used up.

Lowcountry products I shall in every sense leave alone.

* Is it not rather the duty of the Planters' Association?—ED. *T. A.*

HILLCOUNTRY PLANTING REPORT.

NANUOYA, March 17th, 1891.

WHITE CLOVER

to our Irish friends in Colombo (by way of substitute for the true shamrock), until after the tappal was gone. The history of that same white clover is very curious. I got the seed from Australia in 1879 or early in 1880, and sowed it in the valley in which our tank was subsequently formed. There it continued to flourish year after year; and about 1885 we removed plants of it to a lawn in front of the upper bungalow. Subsequently the lawn was dug up, the grass and clover were entirely removed from the soil (so it was thought), and the space was laid out as a flower garden. About a year ago a portion was dug pretty deeply and manured for the reception of flowering plants; when, suddenly, the white clover came up more fresh and flourishing than ever, and filled an entire bed with its snow-white blossoms and its pretty, trijunctive green leaves. We cherish the freely flowering clover for the sake of "Home" associations and also for

the illustration it affords of the wonderful vitality of the genus of plants to which it belongs. Have I not read that the roots of the red clover have penetrated the soil from 3 to 4 and even 6 feet down into subterranean drains, and not only that they conserve nitrates in the soil, but that the plants to which they are attached enrich the land in which they grow with nitrogen derived from the atmosphere? The *leguminosæ* are now found to be still more valuable in this respect, and some readers of the *Observer* may remember that Baron Liebig, writing to the late Mr. Crüwell, advised the coffee planters of Ceylon to grow lupins between the rows of their trees, to be turned down as green manure, so imparting to the soil their stores of nitrogen. I suppose that tea, which is a leaf-crop, requires even more than coffee

SUPPLIES OF NITROGEN;

and it would be interesting to know if any experiment has been tried in burying green plants in the soil in which tea grows, before the blossoming or at any rate the seeding stage of such plants. In the experimental station at Cawnpore, hemp has been found an excellent improver of the soil by being buried in its green stage. I have never grown green crops for the purpose of being buried; but early in its existence I treated a patch of tea to an application of green *nilu* plants laid along hollows between the rows, with China bean manure sprinkled over the *nilu*. We believe we see the good effects of that application to this day, a dozen years after the experiment was tried; but, of course, the China bean cake being in itself highly nitrogenous, it is impossible to say what portion of the benefit was due to the *nilu* beyond the mechanical effect of

OPENING UP THE SOIL TO AERATION,

a very important process. If lupin seed cannot be easily procured, or if lupins will not readily grow here, any pea or bean will suit,—chick pea, gram, kollu or even scarlet runners. In our American exchanges we find constant reference to peas grown as green manure for orange and other orchards; and we submit that experiments should be instituted in Ceylon. Clover, as well as beans and peas, might be tried, the only objection being, that, as our experience here has shown, it is easier to get clover into a soil than to eradicate it.

The railway extension, the progress of which towards Uva we watch with interest each morning and evening as it is being completed across Abbotsford, was

PROJECTED TO SAVE UVA COFFEE.

For that purpose it was sanctioned too late, but from those best able to speak with authority, we have recently had the assurance that it is now certain that, in serving the new staple tea, it will receive more traffic than ever could have been yielded by the old. In how many other ways it may serve Uva and other districts on the eastern side of our "Great Divide," who can possibly predict? It will facilitate

THE INTRODUCTION OF MANURE,

labour, capital and European enterprise, and as that enterprise prospers so will all native interests from the growing of rice, maize, legumes and millets to the culture of roots and leaf-vegetables and fruits, for the superior growth of the latter of which the climate is specially favourable. Cattle farming and dairying and even manufactures (that of paper from mana grass to begin with) are pretty sure to follow. Judicious irrigation schemes by all means, until even the arid parts of Uva grow a surplus of cereal food; but for the success of irrigation and all other enterprise, the one desideratum is to be found in

FACILITIES OF TRANSIT AND INTERCOMMERCE,

such as good roads laid the foundation of, and to which the railway puts the crowning top-stone. At Nanuoya, as your readers are aware, our mountain railway attains an altitude of 5,297 feet above mean sea-level. The engine entered Abbotsford eastern boundary, 1½ mile from Nanuoya, at an elevation of 5,497 feet, and will leave the western boundary for the Government forest at a few yards from the second mile, having attained an altitude of 5,558 feet. The gradient at the entrance is 1 in 52·80 and towards the exit it is eased to 1 in 55. There are two large cuttings in this serpentine line of half a mile. One severs a ridge which runs down the estate and across which a foot and horse bridge will be placed to restore the connection. This cutting is over 31 feet high, while the much more formidable cutting at the outlet from the eastern side of the estate (the land runs more than 2 miles from north to south) is about 53 feet in perpendicular height. A still greater cutting beyond the 3rd mile with which Mr. Rosling has to deal, and from which a slip of about 1,000 cubic yards had at one time to be cleared away, is 80 feet perpendicular and fully 100 in the slope. For a little more than a mile beyond Abbotsford, the line goes through

BEAUTIFUL FOREST SCENERY,

the forest sloping up the sides of the Katapihillamana range. It then runs between the cultivated land of Penmynnydd and Calsay and the forest to the 5th mile. Hence to the 7th there is magnificent scenery of forest, river, waterfall, gorge and ravine. Beyond, the rolling grassy prairies known as Elk Plains open up, framed in by forested mountains. On these Plains the Ambawala station to suit the New Galway and other estates near Hakgala will be placed. The patanas stretch nearly up to summit level, which is practically the height of Nuwara Eliya, and where, we suppose, there will be a station, which the opening up of Horton Plains may yet render important.

Just as I wrote the above I received a letter from a correspondent in Uva about the *damba* tree He writes;—

"In *From the Hills* in your issue of 10th March you say 'the *damba*, a mere variation of *jambu*, is, I suppose, the *wal jambu* of Trimen's list, but certainly the natives pronounce the name *damba*.' They are right. That is the proper name of the tree. Next to *Millille* and *Leang* it is the best building timber in Uva. One store I built with it 30 years ago is now as sound as ever. It used to abound formerly, you will recognise the name in *Damba-gaha*, *Damba-tenne*, *Dambawelle* and *Damba-gas-talawa*,—*gas*, the plural of *gaha*—Jambu gaha is the tree bearing the jambu fruit, sometimes called the rose-apple, bright pink on *one side* and which I first saw in Bengal before coming here—is a totally different tree growing at a much lower elevation and *not* choice timber. The *wal jambu* is the wild tree in the jungle and like the wild mango, and wild nutmeg (*molibodde*) next to useless for building purposes. Our tea flourishing all over Uva flushes all through the hot weather and the continuous wet. By the bye, where is Uva, which name is not Sinhalese or English or any known language, is it Euvah or Youvah?"

I gather, therefore, that while *damba* is, as I have long known, one of

OUR BEST HILL TIMBERS,

the tree known as *wal jambu* is very inferior. It is curious that Trimen, who gives *dan* and *maha dan* as Sinhalese names for Eugenias, ignores *damba*, which is no doubt the Elu form of *jambu* and applied to the mountain species. In Trimen's list the Sinhalese name for one plant is actually *tolol!*

March 18.

Speaking with the reserve begotten of experience, it looks as if the rain burst of March had about

EXHAUSTED ITS MOISTURE STORES.

Yesterday was a genial day, with a few rolls of thunder and a shower in the afternoon which deposited 34 cents of rain. The evening was beautiful, with veils of white mist floating across the faces of the mountains. A golden sunset was succeeded by silvery moonlight, incessant lightning flashes making themselves visible *in the south west* horizon. This morning is calm and sunny, although masses of mist rest on the brow of Totapola and other mountains which separate us from Uva. The thermometer stands at 55°.

SALE OF ESTATE PROPERTY.

Mr. Withers has sold Adelaide estate, Lower Dikoya, to Mr. H. L. Forbes for the Scottish-Ceylon Tea Co. It is certainly a bargain for the Company as adjoining one of their outlying properties, Benachie, for which it affords waterpower, Adelaide has 158 acres fine tea all but 50 acres in bearing with 47 acres in forest and not less than 25 available chena. The price paid is only R30,000. The secret of such properties being sold at moderate rates is no doubt found in the fact that a tea plantation with fully equipped factory requires to be of a much larger acreage than the average coffee estate, to ensure economical, profitable work. We are pleased to see the process going on which will bring not less than 400 to 500 acres of tea in bearing to each factory.

TEA IN THE GALLE DISTRICT.

What tea can do in the lowcountry is evidenced by the prices obtained yesterday by Messrs. Forbes & Walker for "Freds Ruhe" which is only about 130 feet above sea-level, close to Galle, owned by Mr. Wm. Abeyesundra of the P. & O. Co. The prices were as follows :—

1,110 lb. B. B.	60 cts.	885 lb. Broken Tea	37 cts.
2,500 lb. Pekoe	45 „	165 lb. Dust	31 „
2,501 lb. P. S.	40 „	62 lb. Red Leaf	32 „

These rates compare favorably with many of those realized for tea from the high districts, and seeing that the cost of laying it down in Colombo is under 30 cents per lb. there is an excellent margin for profit. "Freds Ruhe" estate comprises about 270 acres, of which 210 are in full bearing, the output being manipulated by a Brown's Desiccator and Blackstone Roller propelled by steam power. The results obtained from this estate should be welcome to the shareholders of the Talgaswela Tea Company and other low country concerns, which are now coming into bearing. Who dare despise the lowcountry after this?

THE MARKETS FOR TEA—AND PROSPECTS.

(*By one interested as a grower.*)

The latest London statistics and reports show that Chinese low priced teas are still urgently wanted by the trade (not necessarily by the consumers). In the late spurt Chinese congou rose rapidly until about 80 per cent from lowest point was reached. This is unfortunate and augurs not well for India and Ceylon in the near future. This great rise took place too when exchange dropped to its lowest. No doubt some large orders went out to China for "more" for mixing purposes.

America unfortunately appears to be chockfull of tea just now, and prices there are said to be lower than in London. 70,000 half-chests said to be kept back by American buyers at Amoy, for they fear to ship and depress still further prices in America!

Australia is said to be threatened to be almost surfeited by shipments from India, and prices there are soon, it is stated, likely to be lower than in London.

So *Russia* at present seems to be the great point to make for Ceylon, but their stewing process in place of 5 minutes' infusion, and only one brew does not augur well for a Russian demand for strong teas from India and Ceylon. Still the Russians must be converted at any cost—Ceylon cannot do without some very large market in addition to the United Kingdom.

If in the present season Ceylon ships 55 millions and India 115 millions—not at all unlikely—to the United Kingdom, and China shipments begin to swell out again under the impulse lately given, who shall prophesy as to what prices may be a year hence! China is still the unknown quantity, and until fairly ousted from the United Kingdom (to begin with) must always remain a disturbing factor so long, of course, as thousands of unblushing blenders continue to flourish.

VALUE OF VEGETABLES AS MEDICINE.

There can be no doubt that many of the ailments we suffer from are the result of abstinence from vegetable diet, or a too great indulgence in animal food. Custom has made the potato an essential at the dinner table, but rarely do other vegetables find their way there. The following notes as to the uses of vegetables are from the *California Farmer and Dealer*:—

Spinach has a direct effect upon the kidneys.

The common dandelion, used as greens, is excellent for the same trouble.

Asparagus purges the blood.

Celery acts admirably upon the nervous system, and is a cure for rheumatism and neuralgia.

Beets and turnips are excellent appetisers.

Lettuce and cucumbers are cooling in their effect upon the system.

Onions, garlic, leeks, olives and shalots, all of which are similar, possess medical virtues of a marked character stimulating the circulatory system and the consequent increase of the saliva and the gastric juice promoting digestion.

Red onions are an excellent diuretic, and the white ones are recommended to be eaten raw as a remedy for insomnia. They are—tonic and nutritious.

A soup made from onions is regarded by the French as an excellent restorative in debility of the digestive organs.—*Mildura Cultivator.*

GARDENING: OUR REVIEWER.

Firminger's Manual of Gardening, for Bengal and Upper India,* has recently seen its fourth edition and is this time very carefully and ably revised, corrected and amplified by H. St. John Jackson, late editor of the *Indian Agriculturist*, and for several years Superintendent of the Public Gardens at Jeypore.

This is a most useful and valuable book, supplying all the information that an amateur horticulturist can wish for, and thus it certainly fulfils the intention of its author. The botanical names are also correct. The notes on the cultivation of each genera are really first-class, and it would be hard to improve them, and cultivators will be sure of success if they faithfully carry out these instructions. There is something said about nearly everything that is at all likely to do in the East, and the book is so well arranged that any information one may want is very easy to find.

Firminger's book is an old favorite with Indian residents; the plan of the book in this new issue is somewhat altered and improved. It is divided into four parts, viz., (1) the operations of gardening; (2) the vegetable garden; (3) the fruit garden; and (4) the flower garden. An appendix has been added

* Thacker, Spink & Co., Calcutta, 1890.

giving the recent introductions among flowering and ornamental-leaved plants; also new chapters are introduced dealing in considerable detail, with grass conservatories, orchid houses, fernery and propagating frames, with illustrations. The largest additions will be found in part IV., where new chapters are given on Ferns, Orchids, Mosses, Roses, Aroids, Palms and Crotons, &c. The volume consists of 662 pages; the type is clear, and the binding substantial.

The first chapter treats of Climate, Soils and Manures, and this latter subject is treated very fully, the directions about preparation of charred vegetable manure, about the mixture and due proportion of fertilizers, and the relative values of various applications are all practical, and can easily be followed and carried out. Vegetable, mineral and liquid manures are separately treated. In Chapter II. are treated the Laying out of a Garden, Lawns, Hedges, Irrigation, Conservatories, Betel-Houses, Implements, Vermin, &c., c. The information on the erection of Grass-Conservatories or Betel-Houses may have practical interest for some Colombo residents. We quote from it as follows:—

"Some time ago the happy idea occurred to Dr. Anderson that structures, somewhat similar to those in which the natives of Bengal have from time immemorial grown the Pan, or Betel plant, might be employed with advantage in the cultivation of plants that in nature exist in a climate nearly alike to that in which the Betel thrives. The attempt was made and proved a wonderful success. The structure in itself is a simple and inexpensive thing. On a piece of ground, measured out according to the space required, stout bamboos are driven at intervals, so as to stand erect about seven feet high. To these a lattice of split bamboos is attached, much in the way in which enclosures for fowls are usually made in this country. Over the whole lattice, on the sides as well as the tops, a layer of *Ooloo* grass is bound, just so thin as to allow of an equal proportion of sunlight and shade, producing a kind of subdued light. Stages are then erected, either of brickwork or wood to rest the potted plants upon, with space left for paths around or between them.

"When about to erect a grass conservatory, select a piece of ground away from the shade of large trees. Its length should, if possible, run north and south. The size will depend upon individual taste, and local circumstances and surroundings. 50 feet by 30 feet is a convenient size."

The tat-house is, indeed, already introduced into Colombo, and ferns and sellaginellas thrive well in it; but to those who have not seen them, the hint may be useful. Most interesting are the succeeding chapters on the various ways of multiplying and propagating plants, on cutting, budding, layering, grafting, &c., &c.

On one of the operations of gardening, *i.e.*, Root-Pruning, it is remarked that the Indian practice is the reverse of the English; instead of removing the soil at some distance from the roots, they dig up close around the stem, clear away some of the small roots, and after a week or two fill in with manure and cover over again with soil. The object is to make fruit-trees healthy by keeping their roots near the surface.

Then follows next a calendar of operations for every month in the year for Vegetables, Fruits and Ornamental Plants. And then comes the Vegetable Garden. Every kind of vegetable and of fruit-tree is named, and the due treatment of each is given.

The remaining portion of the book is devoted to the Flower Garden, including Ornamental Annuals, Ornamental Trees, Shrubs and Herbaceous Perennials, a very full list, and the directions for the cultivation of each are complete.

Cinchona in Uva is fast becoming a thing of the past, and although the young clearings on Canaverell'a afford a picture of robust health, yet the laird now looks forward to the day when tea may take the place of cinchona. Mr. Macfarlane, on the whole, has been, we suppose, the most successful grower of cinchona in Ceylon on a considerable scale.

NOTES ON POPULAR SCIENCE.

By Dr. J. E. Taylor, F. L. S., F. G. S. &c.,

Editor of "Science Gossip."

An American professor of agriculture, Professor Atwater, has just published the result of a series of experiments concerning the proportion of nitrogen taken up by plants. He showed that with nitrogenous fertilisers the proportion of nitrogen in the produce, both stalk and seeds of crops, was notably larger than in similar produce where no nitrogenous fertiliser was used. Comparing American with European crops, Professor Atwater demonstrated that in respect to their relative richness in nitrogen the crops from the liberally fortilised soils of Europe yielded considerably more than the same crops in America. From this it appears that nitrogenous fertilisers vary and increase the food value of feeding crops without increasing the yield in weight.

Professor Bruckner, a Swiss artist of Berne, has recently called attention to the existence of climatological period of about 35 years for the entire globe. These periods are, of course, more marked in the interior of continents. The years 1700, 1740, 1780, 1815, 1850, and 1880 appear as cold, wet periods; whilst the years 1720, 1760, 1795, 1830, and 1860 were warm and dry universal periods. During the warm periods, the passage of oceanic air to the continents has been hindered, and during the cold periods it has been favoured, increased rainfall taking place in the latter case.

Paper pulp is one of those things a good many inventors think of. It promises to lend itself (like a professional politician) to anything—from cellulose or artificial ivory knife and fork handles and billiard balls to railway waggon tires and rails. It is a carbonaceous raw material out of which a good deal can be made—a kind of manufacturing protoplasm in short. I refer to this fact because of a paragraph, which appeared in a French technological journal last week, announcing that a certain French manufactory is now bleaching paper pulp by ozone. The latter is a powerful bleaching agent, as many Lancashire and Yorkshire bleachers know. In the French manufactory, it is stated the ozone is prepared by passing electrical discharges through oxygen, whilst the paper pulp is passed continuously through a chamber containing it. This process is said to be far more rapid than that by chlorine (hitherto the latter has been chiefly used in our Lancashire bleachworks), and far more convenient. Moreover, the ozone does not attack the cellu'ose itself, as is almost necessarily the case with the chlorine process. It only abstracts the native or raw colouring matter. This new process will probably startle our Lancashire and Yorkshire bleachers.—*Australasian.*

Rio Janeiro.—The Vicomte de Saint Leger has just established in Rio a company under the title of the Companhia Floricultora Brazileira, for the purpose of providing amateurs with Orchids and other plants. The capital is 500:000,000 reis, or 1,250,000 francs =£50,000.—*Gardeners' Chronicle.*

Cement.—Professor Alex. Winchell claims to have a cement that will stick on anything. The recipe is as follows:—Take two ounces of clear gum arabic, one and a half ounce of fine starch, and half an ounce of white sugar. Pulverise the gum arabic and dissolve it in as much water as the laundress would use for the quantity of starch indicated. Dissolve the starch and sugar in the gum solution. Then cook the mixture in a vessel suspended in boiling water, until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by dropping in a lump of gum camphor, or a little oil of cloves or sassafras. This cement is very strong indeed, and will stick perfectly to glazed surfaces, and is good to repair broken rocks, minerals, or fossils.—*Indiarubber Journal.*

"NATIVE GUANO"

is one of the manures competing for public favour in our market. Messrs. W. H. Davies & Co. advertise it as

A safe and Reliable Fertilizer for Tea, Coffee, Coconut Trees, Potatoes and Kitchen Garden Produce, Grape Vines, Fruit Trees, Tomatoes, Roses, Lawns, Chrysanthemums, Pot Plants, &c.

and from a pamphlet of testimonials by British farmers, orchardists and gardeners which has reached us from the firm named, it seems fully to deserve this character. It is prepared from sewage by the Native Guano Company, Limited, London, Kingston-on-Thames and Aylesbury. In the English pamphlet sent to us by Messrs. W. H. Davies & Co. for notice, we observe that the

Price at the works at Kingston, (Surrey), or Aylesbury, (Bucks), is £3 10s per ton, in 2 cwt. bags. Orders not exceeding 10 cwt. are charged at the rate of £4 per ton. Carriage paid within 100 miles of Works on Cash orders of 2 tons and upwards. A single cwt. Sample bag sent, carriage paid, to any Railway Station in England on receipt of Postal Order for 5s.

Even allowing for the depreciation of the rupee, the local price of R110 per ton, delivered at the raiway station, Colombo, seems high, especially in view of the fact that ground bones and white castor cake can be obtained for as nearly as possible half the money. The justification of the high price must be sought for in the greater richness of the Native Guano in active fertilizing qualities. We find Dr. C. Meynott Tidy and Professor Dewar reporting on the substance thus:—

"The percentage of combined nitrogen in the manure is consequently remarkably constant, and amounts to an average of 3 8 per cent reckoned as ammonia in the perfectly dry manure, or if with 20 per cent of water to 3 per cent of available ammonia."

The analysts add:—

"As the phosphoric acid is also an important ingredient from a manurial point of view, it was estimated in four samples of the manure taken from different parts of the heap, an average of 5 0 per cent reckoned as tricalcic phosphate of lime being found. As to the manurial value of the Native Guano, we are strongly of opinion that this must be judged rather by the practical results of the agriculturist than by presumed theoretical values based on analytical data, and on the price of ingredient not necessarily in the same physical or chemical condition. Recent research tends to show that very small changes brought about in soils may have very important indirect effects."

The Company themselves state:—

"The Guano is dry, inodorous, and its fertilizing properties are great. It contains nitrogenous matter as well as phosphates, alkaline salts, saponaceous compounds, &c., and has a combination of manurial elements in such proportions as suits the crops, and produces satisfactory results, fully bearing out the following opinions of Baron Liebig:—

"In the solid and liquid excrements of men and animals, we restore to our fields the ashes of the plants which served to nourish those animals."—*Liebig's Chemistry of Agriculture and Physiology, Page 1c0, 4th Edition.*"

"It is of great importance for agriculture to know with certainty that the supply of ammonia is unnecessary for most of our cultivated plants, and that it may be even superfluous, if only the soil contains a sufficient supply of mineral food of the plants when the ammonia required for their development will be furnished by the atmosphere. It is also important to know that the rule usually adopted in France and in Germany of estimating the value of a manure according to the amount of its nitrogen is quite fallacious, and that its value does not stand in proportion to its nitrogen."—*Liebig's Chemistry of Agriculture and Physiology, Page 212, 4th Edition.*"

We are, therefore, led to infer that the value of the manure is not to be judged by the proportions of nitrogen and phosphoric acid shown by analysis (potash is not separately specified) but by the general combination of manurial elements and their potent action on soils and on plant growth. Appeal is made to the long list of testimonials received as to the results obtained by those who tried the manure on widely varying products, such as cereals, roots, fruits and flowers; and certainly a large proportion of the testimony is unqualified as to the valuable effects of the preparation. It not only promotes the growth of vegetation and the formation of fruit, grain and roots, but it is described as "an effectual remedy for fly, slug, wireworm and garden pests." It may be applied advantageously to wet soil, as liquid manure, or with its own bulk of fine earth. So applied, its effects were as follows:—"Only a cottager," having by its aid obtained very good potatoes, good onions and splendid turnips, describes it as a very cheap and durable manure. A gardener testified:—

Used for cucumbers, melons, tomatoes, vegetables and pot plants in general. Results: very good. Tomatoes, cucumbers, celery grown entirely without any other manure have turned out excellent. I added about 1 lb. of Guano to 1 bushel of pure loam for tomatoes, and top dressed them afterwards at intervals of a fortnight with a fair sprinkling of Guano mixed with fine soil. The result was an enormous crop; quite surprised many gardeners in this neighbourhood.

Another:—

Used for cauliflowers, spring cabbage, carrots, radishes, onions, Brusses sprouts, and vegetables generally, also for flowers. Results: very good and satisfactory. I have had this garden 10 years, but never had such crops before. My neighbours speak well of it.

Another reports splendid crops and that the guano produced much finer crops than those grown with stable manure. To quote again:—

I have only used your manure for pot plants at present, and, so far, I am in every way satisfied with it. I use it mixed with the potting soil, and in liquid form for watering. In this it has a great advantage in settling quickly, enabling one to use it as soon as mixed. I have used other manures, but never had such results as from this.

Finally a Scotch testimonial:—

The Native Guano was used here for turnips, the field being dressed with farm yard dung in the autumn and ploughed in the spring. Part of the field was sown in the drill with Native Guano at the rate of 10 cwt per acre, costing £4 per ton, and part of it sown in the same manner with other Guano at the rate of five cwt. per acre, costing £10 10s a ton. The turnips on the ground dressed with Native Guano being a *better* crop than that done with the other Guano, considers the Native Guano a very useful manure for all kinds of farm crops. The soil here heavy coarse clay.

Messrs. W. H. Davies & Co., tell us they are supplying the Native Guano for tea and cacao as well as for garden produce; and we presume the results have been satisfactory. For estate purposes as well as for fruit orchards, vegetable gardens and grass lawns and pasturage, the substance certainly deserves a trial. To facilitate this, Messrs. W. H. Davies & Co. indicate that they supply sample casks containing about 190 lb. at R10 each. Meantime it would be interesting and useful to have the testimony of those who may already have tried the Native Guano (native to Britain), because in such reports there may be encouragement not only for the use of the manure imported and sold by Messrs W. H. Davies & Co., but for the ultimate formation of a local company to prepare really native guano from the sewage of Colombo and our other larger towns. The Chinese are far before more civilized races in their careful conservation

of manurial matter and its return to the soil. The difficulty is to retain manurial matter in an active condition and yet inodorous, and in this respect the Native Guano Company seem to have been successful.

CULTIVATION OF INDIARUBBER.

In *Nature* of January 15, in a note on p. 355, a statement is quoted, to the effect that some few attempts have been made to cultivate indiarubber, but as yet not very successfully. As, however, there are extensive flourishing plantations of *Ficus elastica* in Assam, a short account of their origin and present condition may prove interesting.

After some preliminary experiments on a small scale, the Government of Assam in 1873 determined to plant caoutchouc in the Charduar Forest at the foot of the Himalayas, north of Tezpur. Mr. Gustav Mann, the Conservator of Forests, gave me the necessary instructions to start the work in November of that year, and I remained in charge of the plantation till September 1875. The Charduar Forest has an essentially damp climate, the average rainfall at the caoutchouc plantation having been 94·65 inches during the years 1878—85, and during 1886—89, the annual rainfall was distributed as follows :—

	1886-87.	1887-88	1888-89
Winter Rainfall. November till March...Inches	4·87	7·38	4·78
Summer Rainfall	1886·	1887.	1888.
April till October... „	99·30	71·55	82·39
Total ... „	104·17	78·93	87·17

Data for the temperature of the Charduar Forest are not available, but the following average figures for ten years, for Sibsagar, which lies to the south-east of Tezpur, across the Brahmaputra River, will give sufficiently approximate results :—

Average annual temperature ... ... 73°·4 F.
Average monthly for January (lowest)... 59°·0 F.
Average monthly for July (highest) ... 83°·7 F.

The absolute maximum and minimum temperatures for Sibsagar are not given in the meteorological tables from which the above figures are taken, but quoting from memory, they are for Tezpur about 95° and 42° respectively.

The relative humidity for Sibsagar averages 83 per cent., being lowest in March, 79 per cent., and highest in January, September, and December, at 85 per cent. It is certainly not less than this in the Charduar Forest, where the moist hot atmosphere in the summer months resembles that of a forcing house. The Charduar Forest contains a vast number of woody species, both evergreen and deciduous, but chiefly the former, nearly pure woods of *Mesua ferrea* and *Altingia excelsa* prevail in the higher parts of the forest, and the undergrowth consists of dwarf palms, small bamboos, and evergreen shrubs, *Caffea bengalensis* being abundant in places, whilst cane palms are found in the damper parts of the forests, and festoon the trees in company with other huge climbers. A few enormous old rubber-trees are disseminated here and there throughout the forest. *Ficus elastica* has here been measured 129 feet high, with a girth around the principal aërial roots of 138 feet, whilst the girth of its crown was 611 feet.

As rubber-trees cannot stand shade, and the seedlings damp off unless fully exposed to light and well drained, the natural reproduction of *Ficus elastica* generally takes place in the forks of stag-headed or lightly foliaged trees high up in the crown, where seeds are left by birds; and from such a site the aërial roots in process of time descend to the ground, and develop into a vast hollow cylinder around the foster stem, which is speedily inclosed and completely killed by the vigorous crown of the epiphyte, which eventually replaces it in the forest. In its epiphytic growth, the aërial roots of *Ficus elastica* may take several years to reach the ground, but, once well rooted, nothing can probably surpass it in its native habitat for rapidity of growth and vigour.

As, owing to the above mode of growth, rubber trees are so sparsely scattered in the Assam forests, and it is therefore extremely difficult to protect them from being tapped in a wasteful manner, the plan of concentrating them in artificial plantations, as proposed to the Government by Mr. Mann, was carried out as follows :—

At first, attempts were made to propagate by cuttings, which struck readily, but it was soon discovered that rubber-seed germinates freely on well-drained beds covered with powdered charocal or brick-dust, and that the seedlings, though at first small as cress, grew rapidly, and became about 2 feet high in twelve months, and were much hardier against drought than plants produced from cuttings. The base of the stem of the seedlings swells out like a carrot, and this fact, no doubt, enables them to tide through the dry season in safety, for, in spite of the humidity of the air, the nearly constant sunshine from November till March is trying to young plants.

In order to imitate nature as much as possible, some strong seedling rubber-plants were placed in the forks of trees in 1874, and by 1885 only a few of them had reached the ground and were growing most vigorously.

As this method, though much more economical than planting on the ground, gave such slow results, and it was found easy to produce plants in any quantity from seed, large nurseries were formed, in which the plants are now retained until they are 10 feet high, as smaller plants were browsed down by deer when planted out in the forest. The planting lines are cleared to a breadth of 40 feet in strips, separated by alternating strips of untouched forest 60 feet wide.

It was found that the rubber-plants did not get sufficient light with lines less than 40 feet broad, whilst the strips of forest kept the soil and atmosphere moist, and afforded side shelter to the plants, forcing them to grow upwards, instead of branching out near the ground. As this method involves considerable expense in clearing the lines, and wastes the wood, which is frequently unsaleable, Colonel, now General Keatinge, the Chief Commissioner of Assam, in 1874, directed that plantations of *Ficus elastica* should also be made in grass-land near Tezpur. It has been, however, found that large rubber-trees in Tezpur, when tapped, yield scarcely any rubber, the difference between them and the rubber-trees of the Charduar Forest being probably due to the greater dampness of the atmosphere and soil in the latter locality, as compared with the Brahmaputra Valley.

An area only of 8 acres was therefore planted out near Tezpur, whilst the area of the Charduar plantation in 1889, was 1,106 acres, and contained 16,054 plants, besides large nurseries with 84,000 seedlings.

Local Governments in India, which have to find funds for all sorts of administrative purposes, are naturally inclined to economize, and Sir Charles Eliot, when Chief Commissioner of Assam, about ten years ago, proposed to stop further work on the Charduar plantation, but this was vigorously opposed by Dr. Schlich, the Inspector-General of Forests, and at his advice, the Government of India directed the further extension of the plantation. Apparently, however, little progress was made between 1881 and 1888, when an additional area of 63 acres was planted up. Regarding the growth of the plants, the following figures, taken from Mr. Mann's report on the Assam forest administration for 1888-89, give the average height and girth, up to April 1889, of 50 trees in each year's planting :—

Year when planted.	Average. Height. ft.	in.	Girth. ft.	in.	Growth since last year. Height. ft.	in.	Girth. ft.	in.
1874-75	61	11	11	5	6	1	0	9
1875-76	57	6	7	10	5	2	0	6
1876-77	55	10	7	5	3	7	0	6
1877-78	53	9	5	11	5	3	0	7
1878-79	46	2	4	6	4	0	0	5
1879-80	44	10	5	2	5	9	1	2
1880-81	38	7	4	2	6	7	0	8

Thus, we see that the present average annual growth in height and girth, taken from 350 plants, are respectively 5 feet 2 inches and 8 inches.

In the small Tezpur plantation, where there are now 794 plants, all of 1874, the average height and girth are 47 feet 3 inches and 10 feet 10 inches respectively, the average growth in one year being 4 feet 4 inches in height.

The up-keep of the plantation consists chiefly in clearing the lines round the plants, but four years after planting the undergrowth is well kept down by the shade of the rubber-trees.

Experimental tappings were made in 1883 and 1884 on 50 natural grown rubber-trees in the Charduar Forest, the total yield being 438 pounds in 1883, and 206 pounds in 1884, giving an average yearly yield of 6½ pounds per tree. Further information regarding the yield of rubber from trees in the Assam forests would doubtless be procurable from the Assam Forest Office, as well as statistics of the cost of the plantations, which are not given in the papers at present before me. W. R. Fisher.

—*Nature.* Cooper's Hill College, February 18.

COTTON AT WATTEGAMA.

Sir,—I was interested in your article appearing in this morning's paper on the cotton enterprize.

I have recently had the pleasure of visiting Captain Gwatkin's Estate at Wattegama where he has planted over 200 acres of cotton, meant principally as shade for cocoa. Most of this cotton is from New Orleans seed with a sprinkling of Sea Island. The greater part was planted towards the end of September last, and during the month of February 19,000 lb. of seed cotton was taken from the trees, worth about 7 cents. per lb. Picking was continued this month at about the same rate until the rains came, when the plants began to throw out leaves and fresh blossom.

If the rain will now cease there must be another heavy crop during April and May, and probably a heavier crop after the S. W. Monsoon. This cotton has had the advantage of land thoroughly cleaned and kept weeded. Captain Gwatkin has done everything thoroughly well, and he will be well repaid. He has a large-sized double acting knife roller gin with engine, and is doing his own ginning. The Spinning and Weaving Co. has bought the whole crop, and the seed is being sold in the district for R3 per cwt.

The cotton is beautifully clean and free from stains; and is in every way a credit to the grower and the district.

I am sure European Planters would find it worth while to grow cotton for shade. It grows very quickly and gives quick returns.

For natives it ought to be very suitable, but for them I should recommend the Kidney kind if seed could be obtained. It will grow almost anywhere, is hardy, bears well, and is perennial. The Spinning and Weaving Co. can buy all clean cotton grown either from America, Kidney or Egyptian seed. The Sea Island kind is too long in the staple for our use, and unless specially fine and regular in length and colour does not sell well in England.

Yours faithfully,

Colombo, March 18th 1891. H. Atkinson.

—Local "Independent."

Longevity of Tea.—It is interesting to be reminded that Chinese tea "crofters" or gardeners regard their tea bushes even when a hundred years old or over, as still far from being beyond bearing. Many of them say that tea never requires renewal but will go on, like Tennyson's brook, "for ever."

Tea in Uva.—A Dimbula planter who has been visiting Uva is loud in praise of the splendid growth of tea and especially the fine widespreading bushes he saw in Haputale and Badulla districts. The plucking surface on individual bushes will, he thinks, be much larger in Uva as a rule than elsewhere in Ceylon.

STRUCTURE AS A GUIDE TO CULTIVATORS OF PALMS.

We have been favoured with a note on the structure of Palms in relation to their cultural requirements, which orginally appeared in the *Bulletin della R. Societa Toscana di Orticultura*, and which is amply worth bringing before our readers:

"Italy is one among the few States of Europe which, by virtue of its climatic conditions, has been able to extend hospitality to a very considerable number of species of that princely family—the Palm. With the dwarf indigenous form (Chamærops humilis, L.), there has been associated for centuries the majestic Phœnix dactylifera, L., but it is only during the last decade that, through the general march of horticulture and the special efforts of enthusiastic amateurs, about 40 species have been successfully introduced into those localities specially favoured by nature with mildness of climate. The Italian horticulturist cannot find greater satisfaction than in carefully and intelligently studying the requirements of this plant, in order that he may treat them in a suitable manner. Let us begin by observing the Date-palm (Phœnix dactylifera, L.). A well-known Arab saying gives briefly the requrements for Date-palm culture in the words, 'Feet in the water, the head in the fire.'

"If we substitute sunshine for fire, we may, to be consistent, render water as moist soil, especially since this Palm is certainly no aquatic plant, but, on the contrary, suffers from excess of moisture at the root, unless the soil be naturally porous and sandy. From this we might proceed to argue that a moist soil is indispensable to the life of the Date Palm, but this conclusion is far from being in accordance with our knowledge of the facts. We find rather in the Phœnix dactylifera, as in many other plants long acclimatised, a capacity to adapt itself to diverse circumstances, in which it may have been forced to live, provided only that the temperature permit (minimum 25° to 26° Fahr., *i.e.*, 6° to 7° frost) modifying its structure according to the local conditions. Examining the structure of its leaves, we find that these are in every part so constructed as to receive, hold, and conduct to the stem the atmospheric moisture which falls upon them in the form of dew or rain. In fact, it may be observed that every leaflet adhering to the rachis is moulded to the form of a V-shaped channel, in which a film of dew, however thin, concentrates itself in drops, which, arriving at the base of the leaflet (furnished with a gland probably able to absorb a minute quantity of water) find their way down the leaf to the trunk. The leaf itself is provided with shallow flutings, both upon its upper and its lower surfaces, by which more or less quickly (according to the inclination) they again discharge themselves upon the trunk. The dense fibrous coat which clothes the stem is designed for three distinct functions, viz., to defend the young leaves against inclemency of the weather; to shield the trunk not yet arrived at the indurated stage from bruises; and finally to absorb and retain the water received from the leaves to the furtherance of vegetation throughout the plant.

"A phenomenon most deserving of attention on dewy mornings is the appearance of sparkling drops chasing one another down the leaves towards the centre of the plant, so that the thick web upon the trunk becomes perfectly saturated with moisture, whereas the bark of other trees remains almost completely dry. This faculty of appropriation of moisture from the air explains why the Date Palm—which might be called a 'dew-funnel'—can grow in places deficient in water, so far as the soil is concerned. The inner layer of fibre becomes rotten, little by little, owing to the presence of the water introduced by the leaves, becoming thus reduced to vegetable mould, which is kept in its place by the exterior web or fibres yet remaining intact, and also, indeed, by the dried leaves which hang from the stem. To this mould, formed out of the fibre of the plant itself,

is added sand carried by the wind. By means of this atmospheric agency and that of birds, seeds of small plants are very often introduced, which, by growing as well as possible, under the circumstances, increase the bulk of earth around the trunk.

"In time of drought, the Palm, not deriving sufficient nourishment from its terrestrial roots, will put forth aërial ones numerous enough to sustain itself with the assistance of this humus and the nightly dews.

"Glancing now at the other kinds of Palm, *e.g.*, genus Cocos, we find very different—I may say entirely opposite—characteristics. In these everything indicates their absolute dependence upon the soil in which they live. In truth, their leaflets and their rachides instead of being conduit-shaped, V, as in Phœnix dactylifera, are the very reverse—convex, or fashioned like a roofing tile, Λ, in such a manner that rainwater and dew fall from them to the ground. The sparse fibrous material at the base of these leaves evidently serves only for resistance or the defence of the leaves against impetuous winds. Furthermore their stems are not capable of putting forth aërial roots, as is the case with the Date Palm."—L. WINTER, Bordighera.—*Gardeners' Chronicle.*

TEA AND COFFEE SUBSTITUTES.

(*Continued from page 674*).

CAPRIFOLIACEÆ.

40. *Triosteum perfoliatum*, L.—An herbaceous plant of North America, where it is known as wild coffee, fever root, or wild Ipecacuanha. The hard seeds when roasted and ground are said to be a good substitute for coffee,

41. *Viburnum dilatatum*, Thunb.—This plant was first noticed as the source of a peculiar kind of tea in a report in 1885 by Mr, Alexander Hosie, of a journey through Central Tsu-ch'uan. It was noticed in a communication by myself to the *Gardeners' Chronicle* for September 26, 1885, p. 402, and to make these notes more complete, I reproduce it here. Referring to the discovery of this tea by Mr. Baber, Mr Hosie says, "If my memory is not at fault, he (Mr Baber) was regaled by a priest on Mount O-mei, with tea possessing both the flavour of milk and sugar. It may have been in the very Temple on the mountain's side, in which I am now writing, that Mr. Baber was agreeably surprised. At any rate, I am sipping an infusion, which is, without doubt, sweet, and which is declared by the priest to be brewed from a naturally-prepared tea-leaf. It is a large dark-brown leaf, and is very sweet when chewed. The people at the bottom of the mountain, whom I first questioned regarding this tea, asserted that the leaves were sweet because they were first steeped in molasses; but the balances of evidence, as I have since found from extensive enquiry, is against such artificial preparation. The tree is said to grow in only one gorge on the mountain, whence the leaves are brought for sale." We are indebted to Mr. Hosie for a sample of this tea, which consists of the entire leaf rolled up loosely into little balls, and almost black in colour. Upon chewing a portion of a leaf, it was found to be decidedly sweet, with a strong suspicion of liquorice rather than molassos, as stated by Mr. Hosie. Upon soaking the leaves and flattening them out, they were found to be those of Viburnum dilatatum, Thumb. To prove that the leaves of this plant possessed no natural sweetness, we obtained a few leaves from a growing plant and dried them, and found that neither in their fresh, and still less in their dried state, have they any marked flavour. Moreover, the leaves of the Mount O-mei Tea are transparent, as if they had been steeped in some solution, while those which I gathered and dried are opaque, and yet retain their green colour. It seems certain, then, that this singular tea owes its sweetness to some foreign substance, as stated by "the people at the bottom of the mountain, and that substance may be molasses, but is in all probablity liquorice."

RUBIACEÆ.

42. *Oxyanthus Gerrardii*, Loud—Under the name of Wild Coffee from Natal, there are some fruits of this plant in the Kew Museum. These fruits are about the size of a Coffee berry, and contain about six hard brown seeds, somewhat resembling in size and appearance a small shrivelled sweat Pea. They are, however, horny, like the true coffee, and upon roasting give off a burnt-like odour; this, however, might be more fragrant if carefully done in a closed and revolving vessel, and considering that the plant is a near ally to the true coffee, it might perhaps be made a useful substitute.

43. *Diplospora Sphærocarpa*, Datz —A small Indian tree of the Western Peninsula or the Western Ghats, from Bombay southward. It seems to be known as Jungle Coffee in Ootacamund, and the fruits, which in shape and size are like a coffee berry, contains a number of small seeds, which upon roasting develop a strong aroma like coffee, and when ground can scarcely be distinguished from genuine coffee. Samples of fruits and the prepared coffee are shown in the Kew Museum.—JOHN R. JACKSON, Museum, Kew.—*Gardeners' Chronicle.*

OUR LABOUR SUPPLY.—We confess to greater anxiety than we felt at the opening of the year as to a sufficient supply of labour for our growing tea industry. The news of distress in Southern India made us then feel sure that Ceylon would be favoured with a large influx of coolies and that the usual flow back would be very much diminished. But the very latest return, that up to the end of February last, shows no fewer than 10,007 departures against only 6,545 arrivals, and from different planting districts come complaints of "crimping," unsettlement of Kanganies, &c., sure signs of labour being in keen request. One explanation given of coolies not coming to Ceylon so freely as was expected is that they are now leaving Southern India for other countries—Burma, The Straits, West Indies &c.—far more freely than they used to do. This is a point on which the Planters' Association might well make enquiry.

TEA TRANSPORT AND FINAL TEA PREPARATION NEAR COLOMBO.—Our planting "Visitor" propounded an idea in his letter [see page 725] which is enough to frighten Mr. Pearce out of his propriety,—to make

—each particular hair to stand on end,
Like quills upon tho fretful porcupine!

It is nothing less than that the carriage by rail upcountry of tea-boxes, hoop-iron, lead-lining, and all the etceteras, including a great deal of machinery, should be dispensed with! [What would become of the railway revenue then?] And that tea in a semi-prepared state should be forwarded in air-tight bags to the vicinity of Colombo—some of our stores, at any rate, are supposed to be too much under the influence of sea air—and there finally prepared with a refiring and then packed in the boxes for despatch to England. Thousands of men, women and children in the Colombo district, would rejoice in the revival of a Preparing and Packing Industry of this kind, and the division of labour might no doubt, be a great relief to harassed estate managers upcountry, especially at a time when labour is by no means too plentiful. But we much fear the realization of "Visitor's" thought, is still far off. An experiment to some extent in sending down tea leaf by rail to a Colombo store has been tried, but with results not encouraging to any extension of the business. The case might be different with partially prepared tea in air-tight bags, and at any rate there can be no harm in making a trial, *malgré* the General Manager!

Correspondence.

To the Editor.

COFFEE FREE FROM DISEASE: SHOULD SEED BE GOT FOR CEYLON?

Sydney, New South Wales, March 2.

DEAR SIR,—I have just read a paragraph in your *Overland Observer* of 5th Feb. on the "Revival of Coffee" (in Ceylon); and thinking it might be of value to those about to plant coffee again and knowing the interest you take in such matters, I venture to state that I have seen in my travels since I left Ceylon, twelve months ago, fine healthy Liberian coffee trees, untopped and bearing a large crop, grown in a country absolutely free from leaf disease. I have as well seen *Coffea arabica*, where there is no disease of any kind, *Hemileia vastatrix* included, and I would be obliged if you would let me know if seed from such trees would be required in Ceylon, as I can, I believe procure some; at the same time would be glad to know the best means of packing the seed as they would be perhaps five weeks in transit.—Yours faithfully, C. P. ATKINSON.

[As Mr. Atkinson is returning to Ceylon in April, there can certainly be no harm in his bringing some of the coffee seed he refers to—though we should not recommend his investing in much. It should be packed in charcoal. Seed from coffee trees free of disease—Mocha and Liberian—was freely imported into Ceylon in the "seventies," by Capt. Bayley among others; but the resulting plants were at once covered with *Hemileia vastatrix*.—ED. *T.A.*]

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, March 10th.

DEAR SIR,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 23rd February 1891:—

EXPORTS OF INDIAN TEA FROM CALCUTTA.

	1891 lb.	1890 lb.	1889 lb.
Exports to Great Britain in Feb.	3,988,534	5,833,908	4,433,555
Exports to Great Britain from 1st May to 28th Feb.	96,944,877	94,963,710	91,260,140
Exports to Australia and New Zealand in Feb. ...	203,47	177,049	105,765
Exports to Australia and New Zealand from 1st May to 28th Feb. ...	4,548,267	3,382,011	2,856,538
Exports to America in Feb.	13,152	212	12,375
Exports to America from 1st May to 28th Feb. ...	131,662	164,697	155,784
Exports to other places in Feb.	113,511	62,034	97,256
Exports to other places from 1st May to 28th Feb.	1,081,276	1,392,004	854,978
Total Exports from 1st May to 28th Feb. ...	102,709,829	99,902,422	95,127,440

—Yours faithfully, S. E. J. CLARKE, Secretary.

SALT FOR AGRICULTURAL PURPOSES: IN COCONUT CULTIVATION ESPECIALLY.

Veyangoda, March 12th.

DEAR SIR,—I mean this to be an appeal to the daily newspapers to help me to secure for the agriculturist salt on special terms. I may mention at the outset that I am not personally interested in the subject My interest in it is indirect. My objects are (1) to benefit Agriculture; (2) the revenue.

Before I proceed to discuss the subject, it is necessary to say that it was discussed *ad nauseam* about a couple of years ago, when I started it. The then Governor or his advisers did not seem inclined to make the concession prayed for. My reviving it so soon after will, I trust, be looked upon as a measure of my earnestness on the subject, of my belief, by the light of experience and observation, of its very great value in agriculture under certain circumstances, and of my determination to do what I can to obtain the concession from the Government.

Of the value of salt in agriculture there are no two questions. On its value in coconut cultivation it would be absurd to dilate. But I am forced to it, as those who joined in the discussion when I started it before, taking their stand on works on Agricultural Chemistry which treat chiefly on the cultivation of roots, grasses and cereals in European countries, argued that as these state that the small quantity of salt discovered in the ashes of plants is invariably conveyed to the soil by natural agencies, therefore it is absurd to say that, in our little island, swept as it is by both monsoons, there can be an insufficiency of salt in the soil, and this argument is extended to inland districts under *coconut cultivation*, where, it is contended, it is not necessary to supply salt by artificial means! Arguments such as these can be used only by those who blindly follow the dicta of science, without adapting them to varying circumstances.

As we all know, the home of the coconut palm is where the "sad sea waves" break at its very roots. Without entering on the vexed question as to whether the East or the West is the original home of the palm, I may state, what everyone will accede to, that the natural home of the plant is by the sea shore, and that its extension to uninhabited coasts was by the agency of waves and currents. Its cultivation inland was the work of man.

Let us now examine the natural conditions under which the palm grows and aye, flourishes. It grows on a perfectly free soil through which the roots roam unrestricted in search of food and water; (2) in situation where the downward roots have a perennial supply of water; (3) in a soil impregnated with salt; and (4) in an atmosphere saturated with saline spray. Now we all know, or at least ought to know, that in cultivating a plant or tree we ought, as far as lies in our power, to conform in everything to the natural conditions under which it grows, if we wish to cultivate it successfully. Of course, it is not always possible to conform in every particular with its natural requirements; but the process by which trees or plants adapt themselves to their surroundings is a slow one and by no means violent. In process of time a tree can be made to grow under conditions which to it are unnatural, but not all at once.

When the cultivation of coconuts was first undertaken in this island, it was on the seashore. It was gradually extended inland, but on the seaborde where the four natural conditions I enumerated existed, though in a modified degree, but where the soil being chiefly alluvial was far richer than on the almost pure sand of the sea-shore. As the low-lying lands on the seaborde became exhausted, the cultivation was carried further and further inland, till at the present time coconuts are cultivated under conditions which do not conform in any one particular with the natural conditions under which it grows It is cultivated in stiff clays, gravels and cabooks, where water is seldom or never within reach of the downward roots, and where neither the soil nor the atmosphere is largely charged with salt.

That the coconut tree resents the gross violation of its requirements, all will agree who will intelligently compare trees as they grow, say in Colombo, and as they are grown even in the most highly favoured districts inland. For a comparison to be of any value, it must be made between trees growing on soil of equal richness. But if it be made between trees growing on rich and poor soils, and if it be in favour of the latter, then we may well stay to inquire the reason why. I think it will be admitted on all sides that the soil of the Cinnamon Gardens at Colombo is about the poorest, if not the poorest, to be met with

in the neighbourhood. It is what is described as a hungry soil, is very poor in organic matter, and owing to its composition has very little retentive or capillary powers. And in many parts of the Cinnamon Gardens a layer of hard sandstone underlies the sand at a few feet depth, and has to be broken through to make holes for plants to be put down. A comparison between trees growing on such a soil, with those growing generally in the most highly favoured of inland districts will therefore be a crucial one. I have a tolerable acquaintance with the inland districts where coconuts grow, and I think have visited all, if not nearly all, the crack estates. As a result of very close and careful observation, I unhesitatingly say that, taken as a whole, the trees in the Cinnamon Gardens are, for habits of growth and productiveness, superior to those in the best inland districts I have visited.

It will be useful to enquire into the reason for this, but the results will be purely inferential, for unfortunately I cannot lay claim to any but the most rudimentary acquaintance with the principles of Agricultural Chemistry. But I do lay claim to the close observation which I have brought to bear on a tolerable knowledge of practical agriculture. To be concise; I think the reason for this is to be found in the fact that in the Cinnamon Gardens, an exact counterpart of two of the natural conditions under which coconuts grow is to be met within a free soil and easy access of the roots to water, while the atmosphere and soil of the Cinnamon Gardens can never be wholly devoid of salt, and in the S.-W. monsoon months must be charged with it. This is the inference I draw from a comparison of the growth and habits of the trees in the poor sandy soil of the Cinnamon Gardens with those grown in the rich, and in some instances, alluvial soil inland.

Abundance of moisture plays an important part in the economy of the coconut palm. The palm is a huge pumping machine for sending up water for the formation and development of its nuts. An examination of the roots will show how admirably adapted they are for this purpose. The trunk too is a soft spongy mass reeking with moisture. An examination of the fronds and their disposition will show that nature intended them to act as so many ducts to catch and carry rain water down the stem to the roots. It ought, therefore, to be the aim of the skilful agriculturist, whenever coconuts are grown in situations where moistures does not abound, to aid nature to obtain the necessary moisture.

As I said more than once before, the habits of trees grown in the inland districts are quite different from those growing on the seaborde. The most noticeable is their inability to support their bunches of fruits without artificial aid. Props to support bunches are the exception on the seaborde, but the rule inland. Bunches, however small they may be, invariably snap at the stem if not propped up when the nuts are a few months old. This till the trees arrive at maturity at 20 years of age and over. What is the reason for this? I hazarded the guess that it may be owing to a deficiency of silica, for that constituent is necessary to stiffen all forms of vegetation. Against this has been triumphantly quoted recent experiments of cereals grown in soils devoid of silica and yet having their stems stiff. I cannot see how these experiments affect the question at issue. In the same way that earthy matter imparts to bones their hardness, so does silica to vegetable matter. It toughens and strengthens vegetable tissues, and remember the strain the stem of a coconut bunch has to bear is infinitely more, proportionately, than that of the stem of cereals. A young coconut weighs from 10 to 15 lb. and bunches with 10 to 20 nuts are not exceptional. A simple sum in multiplication will at once give us an idea of the weight the stem of a bunch has to support. I will not anticipate what I will say hereafter by mentioning how the supply of silicates can be increased. Another bad habit of coconut trees grown inland, is their inability to support their fronds as soon as dry weather sets in. This may be due as much to deficiency of silica, as it undoubtedly is to an insufficiency of moisture, to the balance between evaporation at the leaves and absorption at the roots being disturbed. At this season of the year, the drooping of branches and the dropping of nuts inland is usual. An old Sinhalese man lately mentioned to me, as proof of the severity of the drought recently on the seahorde, the dropping of nuts from old trees, a circumstance not within his experience previously. This is not uncommon inland, and is instanced to prove how important water is to the coconut tree.

These remarks, for the length of which I apologize, are introductory to my subject, which I shall treat of in a future communication. Till then I crave a suspension of editorial comment.—Yours truly, B.

THE ADVERTISEMENT FOR CEYLON TEA THROUGH GARTMORE TEA SELLING AT £10 12s 6d PER LB.

London, E.C., March 13th.

DEAR SIR,—You will see by our circular the remarkable price (£10 12s 6d per lb.) we realized at public auction for a little lot of Gartmore tea. We send you cuttings from the London press on the subject as they may interest your readers and show how much good is done to Ceylon tea by the attention of the public being called to the splendid quality that can be produced if they are willing to pay something over the usual 1s 8d per lb. to 2s per lb.—We are, dear sir, yours faithfully,

GOW, WILSON & STANTON.

In addition to the *Times* from which a quotation was made in our London Letter on Monday, the other leading newspapers in London have published articles referring to the extraodinarily high price of £10 12s 6d per lb. realised at the recent sale of Gartmore tea in Mincing Lane. The *Daily News* alluding to the sale says:—"Probably never been heard of until yesterday even in the early days of the importation of the leaf; though, of course, if the difference in the value of money is considered, the apparently lower prices of the days when tea was at its dearest would be found to be in reality very much higher. The price ranged from 6*l* to 10*l* in these early days. When Garway wrote that tea, in respect of its scarceness and dearness, 'hath been only used as a regalia in high treatments and entertainments, and presents made thereof to princes and grandees,' it was sold to the public at from 15s to 50s a pound. The East India Company's presents of tea to Charles II. in 1664 cost them 50s. Quite recently some special tea was sold at only half-a-crown less than 5*l* a pound, and, on being resold at about 7*l*., was talked of as one of the marvels of the day. Now that a price of over ten guineas has been reached we may ask, are we on the eve of a repetition of the tulip mania, with tea instead of tulips as the craze."

In an article which appeared in the *Daily Telegraph* it is said:—"In the olden times connoisseurs paid fancy prices for rare vintages of port or claret. Nowadays the taste seems to have changed, and tea takes the place of wine in the high figures of the auction mart. Some days ago 'all the world wondered' when a pound of tea sold at a public sale for £4 7s 6d, but yesterday saw the same quantity of tea-leaf from Ceylon vended for more than double that sum. * * * * Should the value of the Eastern plant continue to advance by similar leaps and bounds, a tiny cup of tea may soon be expected to form the rarest liqueur served at select City banquets."

The *Daily Oracle* records an interview on the subject of the sale from which we extract the following:—"This sample of tea sold was grown at a high altitude. Its purchasers are the Mazawattee Ceylon Tea Company. This company is attracting attention to the better class teas. People seem to have got into the idea that it is only necessary to pay from 1s 8d to 2s per lb. for tea. They cannot get the finest qualities at the price. Tea is actually sold in Mincing-lane in bond for much higher figures. A large quantity of tea is sold

in the Lane at from 1s 6 to 3s per lb. It is used for blending, so that the public do not get this finer tea pure at the lower rates. There is no doubt about the hold which Ceylon teas are obtaining on the popular taste, the Indian teas are also fetching as good prices in the market. I think the two teas go very much hand in hand so to speak. Of course, better Ceylon and Indian teas will be produced if planters are stimulated by more remunerative prices in the market. I don't suppose that such a price as we obtained yesterday can always be obtained. There is no doubt that better prices can be made. * * It is to the interest of the public as well as the planters that higher priced teas should come into the market. * * "It is an extraordinary thing to me, the way in which Ceylon and Indian teas have crept up, and China teas crept down. China not so long ago had the field all to herself. China teas, however, fell off in quality and into public disfavours. Ceylon teas have only been cultivated during the past 20 years, and Indian tea for not more than half a century. We do not sell China tea at all. We only sell the Ceylon and Indian teas, both of which possess intrinsic merit."

Comments also appear in the *Globe*, *Financial News* and *Daily Graphic*; and Messrs, Geo. White & Co. who are qualified to speak with some authority state in their India, Ceylon and Java Tea Memoranda:—"To avoid disappointment to future shippers of fancy lots it should be borne in mind that under ordinary circumstances such tea in larger quantities would probably not fetch tithe of price quoted.

Nature says :—"The tea ought to have very special qualities"; and the *Chemist and Druggist*, alluding to the sale as "the sensation of the week," observes —"This price which far exceeds that paid for the two previous lots, is, of course "fancy" one and has been conceded in all probability with a shrewd eye to advertising advantage. In quality the tea resembles the "golden tips" sold two or three months ago at what was then the highest price on record but it is rather brighter."

The London correspondent of the local "Times" has given the following account of the sale :—"The bidding mounted up by ten shillings in place of the usual farthing, and as each of these was proclaimed it was received with a burst of cheers which increased in volume as the former high record of £5 10s 6d was passed. By that time some of the buyers became less urgent, and when at length £8 was reached several dropped out of the running. Much amusement at this point was caused by a broker of rather nervous temperament who became so excited that, standing up on his chair, he became suddenly deadly pale as though about to faint, when acting by the ordinary sale rule of farthing bids, he found sufficient voice to cry a little above a whisper "eight pounds and a farthing"; which materially evoked shouts of laughter and which someone capped by a bid of "eight-ten," and so the bids went on until the unprecedented price of £10 12s 6d was reached, a bid which was received with rounds of cheering and shouts of laughter. The result of this sale was at once wired to New York; and by the following morning an order came back to secure a quarter of a pound of the precious article *at any price* a commission which I do not believe will be executed."

In a Leeds newspaper, the following appears :—"How very precious tea-growing land in Ceylon must be! A gold mine is nothing to the riches here inviting the cultivator who gets hold of the right soil, and has intelligence in the management of the plants and the garnering of the precious leaves. Recently a consignment of Ceylon tea was sold for something over £5 per pound, and was re-sold for more. The inflation of Ceylon qualities is by no means over, for yesterday (March 10th) in London a small sample of what we must presume was superb and incomparable tea fetched the astounding price of £10 12s 6d per pound! Tea of indescribable superiority is thus becoming almost worth its weight in gold. Nevertheless for ordinary people inherently deprived in taste, tea at from two to three shillings per pound is wonderously refreshing. The high-priced tea referred to may be considered cheap at three shillings per cup."

CACAO CULTIVATION.—STEALING NOT CONFINED TO KURUNEGALA.

Kandy, March 17.

DEAR SIR,—With reference to your footnote to my letter of 13th instant (see page 723) I think you are in error in suggesting that the Kurunegala District is the only one where cacao-stealing is general. What about Dumbara and Matale, where even the Buddhist priests have taken to the new industry ?

As regards the returns from cacao cultivation, are we to conclude that a yield of 1½ cwt. per acre *in alternate years*, constitutes a big crop ?—Yours faithfully PRÆDIAL PROGRESS.

[Are we safe in taking all the acreage as in full bearing and under proper shade cultivation ?—ED. *T.A.*]

CACAO CULTIVATION : MR. HOLLOWAY'S EXPERIENCE.

Franklands, Wattegama, March 18th.

DEAR SIR,—I noticed lately a great deal has been written for and against cacao (Criollo, Forastero, and Caracas), especially "Eldorado" 's attack, and I have thought proper to test and prove that cacao does and will pay if carefully cultivated, even on soil condemned by would-be experts if you only know how to treat that soil, assist your plants with proper shade, and nourishment, and prune your trees at the proper time. When plucking on 11th inst. I selected 100 hybrid Forastero pods : they weighed 200½ lb. on evening of 12th when pods were broken up and put to ferment. On morning of 15th seed was washed, and was dried in good sun to 1 p. m. this day. Seed now weighs 12¾ lb.—204 oz. or—2 oz. to one pod ; this takes 896 pods for one cwt. Some good old Forastero trees on this estate gave 100 pods each and are over five years old, averaging 2lb. each—same kind long pink pods as the 25 exhibited at the Matale Show from above estate two years ago. Plants from seed of selected pods from this estate supplied to and planted in a nursery on Ukkuwala estate, close to railway line, are now a picture to look at. The tamby just now offered to pay at the rate of R65 (sixty-five) per cwt. for this cacao. A sample of ½ lb. is sent by this post.* I firmly believe 200 to 300 pods per tree can be got from this variety of cacao trees after the 6th year with proper cultivation per annum.—Yours faithfully,

J. HOLLOWAY.

MR. HOLLOWAY'S CACAO FIGURES.

SIR,—I am not alone in my condemnation of the inferences Mr. Holloway would have us to draw from the figures given in a letter of his, published as recently as 20th inst.

He may, for all I know, be merely calling attention in an innocent way to the superiority of his cacao seed, but it is very undesirable that such inflated and preposterous reasoning should go unchallenged.

There are, I believe, about 300 cacao trees per acre on an average. Mr. Holloway gives figures showing his belief that a 6 year old tree will bear 200 to 300 pods, and that 896 pods go to 1 cwt. of dried seed worth now R65 per cwt!

I ask you in all commonsense not to allow any intending cultivator to be misled by such absurd statements issuing from anyone setting themselves up specially as cacao growers.

At the rates named above the yield of an acre of cacao would be above 100 cwt. and over R6,500 value per annum per acre. PLANTER.

* The sample, a very fine one, so far as we can judge, can be seen at our Office.—ED. *T. A.*

SALT IN AGRICULTURE: No. II.

Veyangoda, March 18th.

DEAR SIR,—My excuse for prolixity in my previous communication, is that, in order to show that salt is indispensable in coconut cultivation, I thought it necessary to point out the natural habitat of the tree, the conditions under which it flourishes, and its habits.

In the generality of instances, trees grown inland have none of the natural conditions under which this palm grows. The results of this are self-evident to those engaged in its cultivation. How to overcome these should be their aim. To make a stiff soil free, is not as easy a job as those who glibly recommend its being broken up to the depth of 18 inches and limed imagine. The initial cost will be between R25 and R30 per acre. I should be happy to form the acquaintance of the man who will incur this over an appreciable acreage. Besides, to counteract the effects of sun and rain, and of the action of the feet of cattle, the work will have to be continuous. It is, I think far better to recommend something practicable than what, though highly desirable, will not be undertaken. Next, as to a plentiful supply of water. Unhappily, every coconut estate proprietor has not the energy, pluck, enterprise, or command of capital of an Akbar, even though many have the Mahaoya or other rivers skirting their estates. So that that, too, must be dismissed like the altering the mechanical condition of the soil, as being outside the pale of "practical politics." The salting of the soil is then the only operation left us, in the way of conforming with the natural conditions under which the coconut palm grows, and I say it is the most important. In low-lying flats inland, we meet with free sandy soil, having water within easy reach of the roots of coconut trees, and yet the trees growing on them have not the ability to carry their bunches unaided. We may well enquire how this is, seeing that in such situations two of the natural conditions under which the palm grows are present. I think the inevitable conclusion is an insufficiency of salt for its requirements.

Under the circumstances I have detailed at such great length, I call upon the gentlemen of the Press to make a united application to Government to issue salt for agricultural purposes at wholesale prices. Situated as I am away from Administration Reports, I cannot say precisely what wholesale prices are, but I believe they are somewhere about 40 cents per cwt. The cost of manufacture I believe is well within 25 cents per cwt.; so that the margin of profit is not to be despised, if Government can be induced to follow a liberal and progressive policy and encourage the use of salt extensively in agriculture, instead of as now standing stolidly in the way. Of course, safeguards against the revenue suffering would have to be adopted; but the devising of these will surely not be beyond the ingenuity of the legal advisers of the Government. It can be issued only to men of standing, or to those whose respectability can be vouched for by two men of standing. A declaration on honour will have to be given that the salt will be used exclusively for agricultural purposes, and an undertaking to pay a penalty representing the difference between the price it was issued at and retail price for the full quantity issued, if it be proved that, owing to the want of reasonable precautions, any part of it was used for culinary purposes. These are safeguards enough, but another and an indispensable one must be that, before issue, the salt be mixed with some offensive stuff like night-soil at the Government Store and under the supervision of its own Storekeeper, the latter to be supplied by the purchaser in proportions to be fixed upon by the Government. Every practical man who is intimately acquainted with the natives and their deep-rooted prejudices will agree that the last precaution will remove all chances of the salt being used for human consumption. Let not the Government harp on the well-worn string that it is possible to purify and render fit for consumption salt so treated. Let the Government, composed as it is of practical men, deal with probabilities and not possibilities.

To say that an increased consumption of salt will mean increased revenue, is to state an axiom. The increase will not be sudden, but it will be slow, till the benefits of salt in agriculture have been demonstrated. Then, there is the residual salt of the pans, which a glance at the Administration Reports of the Government Agent of the Northern Province and of the Assistant Government Agent of Puttalam will show is destroyed at a high cost. This cannot be characterized as other than a sinful waste of a useful article of consumption and of money. It has been established that this residual salt can, when mixed with bulky manures, be used as a manure. Why not save the money expended in its destruction and turn this substance into an item of revenue?

It will be necessary for me now to detail the value of salt in agriculture generally. In doing this, I will be forced to repeat all the information I collected at much trouble, and what has become available since.

Salt has a two-fold action on the soil, mechanical and chemical. Besides this it is hygrosorptive, and has a value all its own. By its property of absorbing the moisture of the atmosphere, it alters the texture of the soil, and always keeps it moist and free in dry weather. Chemically, it has the property of rendering soluble the Phosphates, Nitrates, Silicates and Potash in the soil. A sour soil is by its application rendered sweet, and the coarse herbage growing in it is rendered fit for cattle. Vegetable tissues are by its application rendered tough and stiff, possibly by the large quantity of silica it enables trees to take up as food. Though experiments have proved that plants can be grown in soils devoid of silica, yet silica is known to help plants to assimilate other plant food. Therein possibly lies the secret of the vigour it imparts to vegetation, and the reason it acts as a stimulant. The late Mr. Davidson, a coconut planter at Jaffna, who shows by his writings a considerable acquaintance with agricultural chemistry, wrote:—"Were I to say salt acts as a *stimulant*, I might state what I could not explain; but I could point to its operation in the animal economy as proof of its possessing properties adapting it peculiarly to a tree in which the ever-circulating sap is perpetually varying in constitution and density. We can then understand why the coconut tree thrives best when it feels the influence of the salt spray. By its ability to supply, or rather to absorb, moisture in dry weather, it helps greatly in proper nourishment and formation of fruit. It can be applied profitably in soils rich in organic matter. It operates on the soil with an influence not produced by any other stimulant, mineral or vegetable."

I think I have said enough to demonstrate its great value generally in agriculture, and of its indispensability in coconut cultivation inland. The Superintendent of the School of Agriculture and at least one of his Assistants have borne willing testimony to its value in agriculture, and have recommended its issue at reduced rates. It is now left only for the gentlemen of the fourth estate to formulate a united appeal to the Government, and for those interested in agriculture to back up that appeal, so as to induce the Government to abandon its dog-in-the-manger policy with regard to this question. By aiding agriculture in the way I have indicated, it will increase the revenue directly by the increased sale of salt, and indirectly by increasing the earnings of the salt manufacturers and of landed proprietors, thus increasing the circulation of capital.—Yours truly B.

HIGH PRICES FOR CEYLON COCOA.

Colombo, March 23rd.

DEAR SIR,—A great deal has been said about a parcel of cocoa belonging to Mr. Payne having sold at R65 and another parcel of Mr. Barber's at R68, but I think if anybody has to be congratulated it is the proprietor of Wiharagame, whose cocoa I sold last week at R73 per cwt.,—the highest price I believe, ever paid in Ceylon for cocoa. I have sold several parcels since at R70, 71, and 73, and have not heard of any sales to come up to that.—Yours faithfully, R. EDLEY.

THE TAXATION ON TEA LAND IN CEYLON; TOLLS, &c.

DEAR SIR,—A great deal has lately been written about the taxation of paddy; but no one seems to have examined the incidence of taxation on tea cultivation. From figures at my disposal I have endeavoured to ascertain as nearly as possible the amount per acre contributed by a tea estate, and the following is the result given approximately:—

	per acre. R	c
Rice Import duty	3	25
Tolls on tea, rice, lead etc., ...	3	00
Stamp duties on deeds, cart notes, insurances bonds, agreements etc.		50
Customs duty and tolls on consumption of salt, salt fish, cotton goods and other dutiable articles by coolies and superintendent.	2	75
Export duties		50
Total...	R10	00

The revenue of Ceylon is in round numbers R15,000,000, but the whole of this is not derived from taxation, land and timber sales, pearl fishery receipts, and the bulk of the railway receipts and harbour dues are not taxes but excluding these the balance derived from taxation is about R9,000,000. The cultivated area of Ceylon is (Ceylon Directory) about 3,000,000 acres, and of this tea occupies 200,000, therefore tea should pay for its fair share 1·15th of R9,000,000 or R600,000 and there is very little doubt that it really contributes at least three and perhaps four times that amount. It has been contended by some that the import duty does not fall upon the planter; but obviously that person pays the tax who would be benefited by its removal. At present I am making a profit of 12½ cents (last year it was a loss) per bushel of rice, this would be converted into a profit of 41½ cents by the removal of the tax, and even if rice was issued at cost price and rates of pay not lowered we should benefit by the increased number of coolies who would flock over when what would practically amount to a rise of pay was given; less coast advances would be needed and less flush lost through shortness of labour. It may also be contended that tolls are not a tax but payment for services rendered, viz., upkeep of roads. A moment's consideration will show that this is not the case, We are supposed to get services rendered for all taxation in the shape of such a Government, etc., and other blessings such as trial by jury etc., etc., and moreover if tolls are merely for the upkeep of the roads they are placed on they should be credited to the districts in which they are levied and any surplus over upkeep should be expended in either improving the roads of that district or in reducing toll there. Toll rents however seem to be paid into the general revenue, and the districts where they are collected get no benefit whatever from them. To make the thing still plainer, if the Government in lieu of tolls were to levy a land-tax from me of R3 per acre, I should be no loser nor would Government, the services would still be rendered, but it would then be seen that a tax was paid. Stamp duties will be generally admitted to be taxation and import duty on personal and coolies' consumption of dutiable articles and tolls thereon stand on the same footing as the import duty on rice.

It appears to be time for a revision of its taxation in the interest of the tea planter at any rate and direct taxation would be preferable to the present system as it would at all events open the eyes of all and sundry to the extortionate amount we have to pay at present. I do not see why we should dread a land tax. Government can hardly assess more for the hillsides and ridges than for the alluvial valleys where the paddy fields are or the chena on identical land just outside the boundary of many tea estates. A land tax would also be fairer in the case of opening new land. At present, tea begins to pay tax through import duty the instant jungle is felled, whereas paddy though an annual crop does not pay for four years. This exemption would no doubt be extended to tea and other products.

The planting representative need not look further than his constituents if he wishes to redress unequal taxation. He might ascertain from the Government for instance on what principle and at what distance are tolls placed on public roads. At present in this neighbourhood there are on a stretch of road 28 miles in length 4 tolls, 2 of them in a distance of 12 miles. The effect of these combined with cost of transport raises the cost of salt 100 per cent, and other provisions are sold at greatly enhanced rates. These tolls therefore operate as a food tax. The cost of tolls on 80 or 90 miles of road is ½ cent per lb. of tea and 12½ cents per bushel of rice, or 25 per cent of the cost of transport in the one case and 16 per cent in the other. In no country that I am aware of are such high rates levied or at such frequent intervals. It is a severe tax on such comparatively valuable commodities as tea and coffee, but it absolutely stifles all vehicular traffic in low-priced native products such as straw, by-products of various palms and jungle produce which it would pay to send to Colombo were transport cheaper. At present carters prefer to return with empty carts if they cannot get a full load, as the extra toll on loaded carts will take all the hire of a half or quarter load. More than half the total toll receipts were collected in the Western Province for the year 1888. This cannot be fair on that province, as it can hardly be that half the expenditure takes place there. I believe if you can lay your hands on the figures that the railway would not be in it as a paying concern with the road from Pelmadulla to Colombo; and surely roads at any rate were not intended as a means of revenue but to develop the country. We have to pay the ½ cent Mr. Skrine objects to and do without a railway as well. What the Badulla planters pay as tolls for the long mileage used by them must be enormous—at least ½ cent per lb. tea. It is a matter the Badulla Association should take up; districts without railways are sufficiently handicapped without being weighted with excessive tolls. If the Ceylon Government would follow the example of the English Government and do away with tolls it would be for the public advantage. The present system is wasteful, a large amount of the tolls going into the renter's pockets. If it is not possible to do away with tolls, they should be reduced to a reasonable amount. It becomes serious when they amount to 25 per cent of the total cost of transport. I see the pet province has no tolls and the Eastern practically none: why this favour? No toll receipts appear for 1888 for the N.-C. Province and only R900 for the Eastern; what can be done in these provinces can surely be extended to the other portions of the island.—Yours truly,

B. B. B.

INDIGENOUS WOODS FOR TEA BOXES A WARNING TO PLANTERS.

DEAR SIR,—With the growing expansion of tea cultivation, comes the great demand for tea-box wood. I have lately observed in some of my travels that the village carpenter has taken to prepare any sort of timber, no matter how inferior. Many must damage and destroy the tea, when used as they now, are in a green and unseasoned state. The

supply of suitable wood has already become exhausted in the native gardens in the Central Province.

There is no need to import tea-box wood into this island while we have so many quick-growing trees, and none can equal that excellent tree the lunumidella, *Melia dubid.* It loves heat and moisture and grows luxuriantly from sea-level to 2,000 feet, and in ten years can be utilized for tea chests.

I consider wild mango, *Mangifera zeylanica*, and the red cotton tree (katu-imbul), *Bombax Malabaricum*, may be used, but the wood should be cut for some time, as the resinous juices they contain are of a corrodent nature and would very soon destroy the lead lining of a tea chest. The following woods should be avoided; nevertheless it is difficult to reject them, as the carpenters mix them up *with other* woods:—Kekuna, *Canarium zeylanicum*.—Wood contains a resinous balsam, is used by the natives for burning after being mixed with paddy chaff, and the smoke given off is reputed to drive away snakes. The wood is worthless and readily attacked by insects. This tree is one of the most characteristic features of a village garden, its silvery white foliage add a pleasing contrast to our sylvan hamlets. It belongs to that Nat. Order *Burseraceæ* producing balsamiferous trees and shrubs.

Rukattana, *Alstonia scholaris*.—Boards of this wood are used by children in the Indian schools to write their lessons on, hence its name. The wood is very light and does not stand exposure for any length of time, is as bitter as gentian; in common use in Ceylon for coffin making. The bark is *a powerful* tonic.

Riti, *Antiaris innoxia*.—A stately evergreen tree with light-coloured shiny bark, common in our village forests up to 1,500 feet above sea-level: wood light and very inferior, rapidly decays when cut up. In the Madras Presidency the natives make bags from the bark by a very simple process. A branch is cut, corresponding to the length and diameter of the sack wanted. It is soaked a little, and then beaten with clubs until the inner bark separates from the wood. This done, the sack, formed of the bark, is turned inside out and pulled down until the wood is sawn off, with the exception of a small piece left to form the bottom of the sack, and which is carefully left untouched. The Sinhalese also form bags from the bark, but in a rude and simple way. The tree produces a small fruit like a fig, purple or crimson, pyriform, velvety and intensely bitter. Known as the upas tree of Java. The upas antiaris poison is prepared from the juice, which flows from incisions in the bark. Belongs to the Nat. Order *Urticaceæ*, containing figs and nettles and many valuable fibre plants.

ARBORIST.

CACAO CULTIVATION.

March 27th.

Dear Sir,—After all that has been lately written in disparagement of cacao by disappointed planters, it is refreshing to see Mr. Holloway coming forward with advice and encouragement for all sceptics.

There can be no doubt that the variety of cacao which he so freely advertises is the very best for planters who know how to treat their soil and to grow shade properly, and who know the right time to prune their trees, but a large proportion of planters have still a good deal to learn; the majority, I believe, never prune at all.

In your issue of 21st instant (see page 739) you made mention of one fortunate proprietor whose crop last year "was not far off an average of 5 per cwt. per acre" a very fair yield.

Your recent correspondent "Eldorado" and other hostile critics, though correct in their arithmetic as to the *average* return (from 12,000 acres planted before 1885) being less than 1½ cwt. per acre, evidently wrote under the impression that an acre in cultivation is necessarily in full bearing when six years old. But the only way to arrive at good results is to calculate, as Mr. Holloway has done, the crop given by the very finest trees, then allow say 300 good trees to an acre and write down one's acreage according to the number of good trees scattered over the whole estate. In this way, most estates will show returns "not far off an average of 5 cwt. per acre," and some even more than this, which will satisfy even "Eldorado," and the figures in your Directory will be brought down from 12,050 to about 3,000 as being under cacao cultivation.—Yours faithfully,

VINCIT VERITAS.

Loss from Insects and Fungi in the United States.—Professor T. Maynard states on the authority of the Entomological Division of the Department of Agriculture, that the loss to the farming interests, including all its branches, for the past year from insects and fungi amounts to $400,000,000, say over £80,000,000.

Pepper Cultivation in Perak is thus noticed in a report on the district of Kuala Kangsa:—

The Secretary to Government arrived here on the morning of the 3rd, and was engaged all day in Court. On the night of the 3rd I accompanied him to Chigar Galah, where we arrived early the next morning, and inspected the pepper estate of Syed Musa. On the whole, the estate appears to be doing well; but as is usually the case with plantations superintended by Malays, there is not sufficient attention paid to the tying up of the vines, and some portions of the estate are not kept so clean as they might be. Mr. Treacher proposed that an experienced Chinaman should be employed to supervise the work of the contractors, who are mostly Achinese. Syed Musa was pleased with the suggestion, and Mr. Lee Kong Lin, who accompanied us, undertook to secure the services of a man for this purpose. There are a number of smaller plantations at Chigar Galah, the owners of which have been supplied with dedap and pepper cuttings by Seyd Musa. The Secretary to Government visited several of these, and also a clearing about 9 acres in extent on the opposite bank of the river, belonging to Syed Abdulrahman. This land has been most judiciously selected both as regards aspect and soil; the latter being even more suitable for the cultivation of pepper than that of Syed Musa's estate.

The Government plantation at Tempurong, which is about 8 acres in extent, includes a large nursery which contains about 30,000 plants, and these can be supplied to planters here at a far more reasonable price than that which they have hitherto been paying for cuttings purchased from Ara Kuda and elsewhere. The Government plantation at Pondok, which was also visited by Mr. Treacher, is a failure, as the Malays and others interested in the cultivation of pepper always predicted it would be. The soil there is composed principally of bat guano, and, although for the first two or three years the pepper vines appeared to be thriving, they are now all dying off.

Great damage is being done to the pepper plantations by the buffaloes that are allowed by their owners to stray at night. In a few instances the former have been captured and the owners identified, but as a rule this is not possible, as the buffaloes come in herds, and any attempt to catch them only leads to further damage being done to the trees and vines.

About twenty years ago complaints of damage done to coffee estates in Ceylon by buffaloes were incessant. Now we never hear of damage done by these animals to tea or other culture.

Cocoa.—That veteran planter Mr. Alfred Payne, of the Kurunegale district, must be congratulated on the fine price he has recently obtained for his cocoa from Isabel estate. It has been sold locally at R65 per cwt., which I believe, is the highest price ever obtained in Colombo for this product.

Cocoa Cultivation.—We learn from a planter whose crop last year was not far off an average of 5 cwt. per acre, that no product responds so well to bulky manure as cacao. Wherever cattle manure or town refuse and sewage can be readily obtained for a cacao field the return is sure to be satisfactory.

Cinchona.—"Crab-Apple" writes:—A friend of mine who owns a large cinchona estate in Wynaad, last July and August shaved 100 acres of Ledger. Renewal at once set in, so fine and strong, that in the early part of February last he decided to coppice the same 100 acres. This work is now almost finished, and up to date most satisfactory results have been obtained. Over fifteen analyses have been taken off different portions of the estate, and in many cases the renewed has analysed more than the orignal bark, though in most cases about the same. As regards quantity of bark, the renewed is as thick, if not thicker than the original: The consignments of bark that have reached the London market have fetched good prices. As will be seen from the above, the experiment has proved satisfactory in every way. I believe this to be the first acreage of any scale that has been shaved, and I think clearly proves that shaving Ledger pays.—*Madras Times.*

Indian Agriculture: Effects of Hemp as Green Manure.—Some very valuable experiments have been made at the Cawnpore Experimental Station, of which Dr. Voelcker has spoken with approval. From the latest report we quote as follows:—

		lb.	
Page 11, average for six years,		950	
,, 12,	ditto ...	1,133	
,, 13,	ditto ...	956	
,, 13,	ditto ...	940	
,, 14,	ditto ...	659	(average of 2 plots).
,, 14,	ditto ...	596	(ditto 6 do.)
,, 14,	ditto ...	614	
,, 15,	ditto ...	586	(ditto 4 do.)

The yield of unmanured land in a series of years is one of the most interesting points on which information is being collected. There are a good many such plots on the farm. I give in the margin the average outturn of wheat per acre of all plots which have been without manure and under wheat for the past six years. In some of these plots the yield is possibly still affected by manure applied before the land was placed under the present series of experiments, and may be expected to decrease in future years. Taking a bushel of wheat at 61 lb., the general yield of unmanured land of the kind found on the Cawnpore Farm—a loam of average fertility cropped year after year and carefully watered and tilled—may be put at 10 to 13 bushels an acre. The American average for all the States of the Union is about 12 bushels. The English average is 30 bushels. The Cawnpore experiments conclusively show that 5 to 10 bushels can be easily added to the average yield by the application of R5 worth of farmyard manure or even by green-soiling with hemp at the cost of R3-8-0 per acre. This is putting the increase at a minimum. The six years' average yield of the plot manured with farmyard manure only in the "Rabi duplicate series" is 27 bushels, and of the plot manured with *poudrette* 28 bushels. Thus we get the American average on our unmanured land and approximate to the English average on our manured. I am afraid that the American average is not unfrequent in many districts of these Provinces, especially in those where canals enable the cultivator to subject the soil to a systematic process of exhaustion. As regards the comparative value of manures, the experience of the Cawnpore Farm is not favourable to artificial or extraordinary fertilizers. Bones, bone-superphosphate, gypsum, kainit, &c., are considerably more costly in this country than the common kinds of manure and so far as they have been tried they have not given commensurate results Green-soiling with indigo or hemp might, however, be more commonly adopted by the Indian agriculturist than at present. The cost of sowing hemp and ploughing it in when green is put at R3-8-0 an acre. But this is chiefly made up of hire of labour and bullocks, and the cultivator can find both without actual expenditure of money. In districts where indigo is not a staple crop, the fields destined for wheat (unmixed) are almost invariably left fallow in the preceding kharif. To sow these with hemp instead of fallowing them would, according to the Cawnpore Farm Experiments, make the wheat crop heavier. Most of the produce of the farm is sold to the public for seed, the seed-grain being carefully cleaned and selected. Dr. Voelcker was of opinion that this branch should be developed, and some of the minor experiments abandoned. I am considering how effect can best be given to this suggestion. The demand for good wheat, cotton, barley, and maize seed is increasing, and in endeavouring to meet it the farm can be of practical utility.

CEYLON EXPORTS AND DISTRIBUTION, 1891.

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1891 B'nch & Trunk lb.	Tea. 1891 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1891 cwt.	Coconut Oil. 1890 cwt.	Pl'bago 1891 cwt.
To United Kingdom ...	16540	...	16540	1135321	11922084	7490	30890	188901	5421	14464	...	31142
,, Marseilles ...	...	33	33	...	8991	39	...	35100	...	...	...	...
,, Barcelona ...	...	...	...	...	3300	...	...	36000	...	...	...	...
,, Genoa ...	...	...	...	...	100	...	...	33700	8400	203	394	...
,, Venice ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Trieste ...	1402	...	1402	...	210	...	...	...	2250	951	600	...
,, Odessa ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Hamburg ...	...	...	...	...	...	77	...	72975	25200	3812	...	8248
,, Antwerp ...	18	...	18	26662	...	...	...	5000	...	602	...	1009
,, Bremen ...	1	...	1	...	1789	...	...	...	...	...	...	...
,, Havre ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	10	...
,, Africa ...	20	...	20	...	5193	...	...	...	...	...	...	...
,, Mauritius and Eastward	11	...	11	...	15570	...	...	...	...	1025	3637	...
,, India ...	661	1151	1812	...	20891	...	41057	14528	...	22498	11044	10
,, Australia & New Zealand	1392	327	1719	...	518393	...	40	1000	2240	603	6	...
,, America ...	...	...	...	141545	30923	991	...	12000	...	20575	4001	47146
,, Stockholm ...	...	...	...	...	...	...	...	...	...	...	...	...
,, Constantinople ...	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 23rd March 1891	20045	1511	21556	1324966	12527444	8597	71987	399204	43511	64733		87555
Do 1890	40819	976	41795	1674324	8002432	6113	106676	325714	61105	19722		79126
Do 1889	24189	2003	26192	2198716	6161935	6680	91280	353067	114493	68245		95635
Do 1888	54544	1295	55839	2223362	3642952	6272	94121	239349	230204	73732		44213

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, February 26th, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
ALOES, Socotrine	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic	Common and good ...	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red...	Renewed	2d a 1s
	Medium to good Quill...	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a 1½d
BEES' WAX, E.I., White	Good to fine	£6 a £7
Yellow ...	,, ,, ...	95s a 115s
Mauritius & Madagascar...	Fair to good	110s a 125s
CARDAMOMS—		
Allepee	Fair to fine clipped ...	1s a 2s 2d
Mangalore	Bold, bright, fair to fine...	1s 6d a 3s
Malabar	Good to fine plump, cliped	2s a 2s 6d
Ceylon. Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s a 1s 6d
Alleppee and	Small to bold brown ...	1s a 1s 6d
Mysore sort	Fair to good bold ...	2s 6d a 3s 9d
	,, ,, medium ...	1s 6d a 1s 10d
	,, ,, small ...	1s a 1s 4d
Long wild Ceylon...	Middling to good ...	6d a 2s 2d
CASTOR OIL, 1sts	White	4½d a 4¾d
2nds	Fair and good pale ...	3⅝d a 3¾d
3rds	Brown and brownish ...	3¼d a 3½d
CHILLIES, Zanzibar ...	Fair to fine bright ...	75s a 85s
	Ord'y. and middling ..	60s a 70s
CINNAMON, 1sts	Ord'y. to fine pale quill...	7½d a 1s 2d
2nds	,, ,, ,, ,, ...	7d a 1s
3rds	,, ,, ,, ,, ...	6½d a 10d
4ths	Woody and hard	5¾d a 7d
Chips	Fair to fine plant ...	2d a 6½d
CLOVES, Zanzibar and Pemba.	Fair to fine bright ..	3⅞d a 4d
	Common dull and mixed	3¼d a 3⅝d
,, STEMS	Common to good ...	⅞d a 1d
COCULUS INDICUS ...	Fair sifted... ..	12s a 13s
COLOMBO ROOT... ...	Good to fine bright sound	20s a 27s 6d
	Ordinary & midling ...	16s a 20s
CROTON SEEDS, sifted...	Fair to fine fresh ...	10s a 15s
CUTCH	Fair to fine dry ...	24s a 32s 6d
DRAGONS BLOOD, Zanzibar ...	Ordinary to good drop ...	50s a 90s
GALLS, Bussorah & Turkey ...	Fair to find dark blue ...	52s 6d a 57s 6d
	Good white and green ...	40s a 50s
GINGER, Cochin, Cut ...	Good to fine bold ...	75s a 80s
,, ...	Small and medium ...	40s a 52s 6d
Rough...	Fair to fine bold ...	32s 6d a 42s 6d
,, ...	Small and medium ...	26s a 30s
Bengal, Rough	Fair to good	18s
GUM AMMONIACUM ...	Blocky to fine clean ...	20s a 50s
ANIMI, washed ...	Picked fine pale in sorts,	£12 a £14
	Part yellow & mixed do.	£10 a £12
	Bean & Pea size ditto ...	£5 a £7 10s
	Amber and red bold ...	£10 a £12
scraped...	Medium & bold sorts ...	£6 10s a £11
ARABIC E.I. & Aden ..	Good to fine pale frosted sifted	60s a 80s
	Sorts, dull red to fair ...	35s a 55s
Ghatti ...	Good to fine pale selected	45s a 55s
	Sorts middling to good...	23s a 33s
Amrad cha.	Good and fine pale ...	60s a 100s
	Reddish to pale brown ...	25s a 50s
Madras ...	Dark to fine pale ...	15s a 55s
ASSAFŒTIDA	Fair to fine pinky block and drop	30s a 50s
	Ordinary stony to midling	16s a 25s
KINO	Fair to fine bright ...	35s a 37s 6d
MYRRH, picked	Fair to fine pale ...	£6 a £8
Aden sorts	Middling to good ...	70s a 85s
OLIBANUM, drop...	Fair to fine white ...	30s a 45s
,,	Reddish to middling ...	22s 6d a 30s
pickings...	Middling to good pale ...	12s a 20s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER	Red hard clean ball ...	2s 2d a 2s 5d
East African Ports, Zanzibar and Mozambique Coast	White softish ditto ...	1s 8d a 2s 3d
	Unripe root	1s 3d a 1s 10d
	Liver	1s 6d a 2s 1d
	Sausage, fair to fine ...	2s a 2s 1d
Assam,	Good to fine ...	1s 8d a 2s 3d
	Common foul & middling	9d a 1s 6d
Rangoon	Fair to good clean ...	1s 11½d a 2s 2d
Madagascar, Tamatave, Majunga and Nossibe	Good to fine pinky & white	2s 2d a 2s 10d
	Fair to good black ...	1s 10d a 2s 2d
ISINGLASS or FISH MAWS } Tongue..	good to fine pale ...	2s 9d a 3s 8d
	dark to fair ...	1s a 2s 6d
Bladder Pipe...	Clean thin to fino bold...	1s 6d a 3s 7d
Purse ...	Dark mixed to fine pale	6½d a 1s 8d
Kurrachee Leaf ...	Common to good pale ...	1s 9d a 3s 10d

EAST INDIA Continued. East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS.
INDIGO, Bengal ...	Middling to fine violet...	4s 6d a 6s
	Ordinary to middling ...	3s 6d a 4s 3d
Kurpah	Fair to good reddish violt	3s a 3s 7d
	Ordinary and middling...	2s 3d a 2s 10d
Madras (Dry Leaf)	Middling to good ...	2s 8d a 3s 2d
	Low to ordinary ...	1s 8d a 2s 6d
IVORY—Elephants' Teeth—		
60 lb & upwards ...	Soft slightly def. to sound	£69 a £76 10
over 30 & under 60 lb.	,, ,,	£64 a £72
40 a 100 lb. ...	Hard ,, ,,	£49 10s a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,, ...	Hard ,, ,,	£25 a £33 10s
Billiard Ball Pieces 2½ a 3½ in	Sound	£78 10s a £88 10s
Bagatelle Points ...	Sli. def. to fine sound ...	£66 a £75
Cut Points for Balls	Shaky to fine solid sd. .	£55 a £73
Mixed Points & Tips...	Defective, part hard ...	£31 a £53 10s
Cut Hollows ...	Thin to thick sli, def to sound	£30 10s a £57
Sea Horse Teeth— ⅔ a 4½ lb.	Crvd. crkd & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Shimlies I, good & fine pale	12s a 13s
	,, II, fair pickings	8s a 9s
	Jubblepore I, good & fine	11s 6d a 12s 6d
	,, II, fair rejections ...	8s 6d a 9s 3d
	Vingorlas, good and fine	9s 6d a 11s
Madras, Upper Godavery	Good to fine picked ...	11s a 11s 6d
,, ,, ...	Common to middling ...	8s 6d a 9s 9d
Coast	Fair	10s a 10s 6d
Pickings ...	Burnt and defective ...	7s a 8s 9d
MACE, Bombay ...	Dark to good bold pale...	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,, ...	64's a 80's	2s 10d a 3s 3d
	83's a 180's	1s 6d a 2s 9d
NUX VOMICA } Cochin, Madras and Bombay	Fair to fine bold fresh	10s a 12s 6d
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour..	⅝d a ¾d
LEMONGRASS ...	,, ,, ,, ...	1½d a 1¾d
ORCHELLA WEED } Ceylon ...	Mid. to fine, not woody	20s a 25s
Zanzibar ...	Picked clean flat leaf ...	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER—		
Malabar, Black sifted ...	Fair to bold heavy... }	4 3-16d a 4¾d
Alleppee & Tellicherry	,, good ,, ... }	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO, Lump ...	Fair to fine bright bold	15s a 21s
	Middling to good small...	11s a 14s
Chips ...	Sli'tly foul to fine bright	9s a 12s
Dust ...	Ordinary to fine bright...	4s 6d a 7s 6d
RED WOOD	Fair and fine bold ...	£3 a £3 10s
SAFFLOWER, Bengal	Good to fine pinky ...	55s a 70s
	Ordinary to fair ...	28s a 50s
	Inferior and pickings ...	15s a 25s
SALTPETRE, Bengal ...	Ordinary to good ...	16s 6d a 17s
SANDAL WOOD, Logs...	Fair to fine flavour ...	£35 a £60
,, ,, Chips..	Inferior to fine ...	£9 a £30
SAPAN WOOD	Lean to good bold ...	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 70s
SENNA, Tinnevelly ...	Good to fine bold green...	6d a 8d
	Medium to bold green...	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a 1½d
Bombay ...	Ordinary to good ...	1d a 2½d
SHELLS, M.-o'-P. ...	EGYPTIAN—med. to large	88s a 100s
	small and medium.	90s a 100s
	oyster and chicken	85s a 100s
large	BOMBAY—fine thick ..	92s 6d a 102s 6d
medium and large	bright fairly clean	90s a 102s 6d
small and medium	,, ,, ,,	90s a 102s 6d
chicken	,, ,, ,,	85s a 97s 6d
oyster and thin .	,, ,, ,,	80s a 92s 6d
Mussel ..	Ordinary to fine bold	24s a 55s
Lingah	Sorts...	3s a 10s
TAMARINDS	Mid. to fine blk not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
TORTOISESHELL ...	Fair & fine clean heavy	17s a 30s
Zanzibar and Bombay	Low thin to mid. clean	7s a 16s 6d
TURMERIC, Bengal ...	Leanish to fine plump finger	14s a 15s
Madras ...	Fin. fair to fine bold brgt	16s a 18s
,, ...	Mixed middling... ...	15s a 16s
,, ...	Bulbs	10s a 12s
Cochin ...	Finger	11s a 12s
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in.	14s a 20s
Mauritius, 2nds...	Foxy & reddish 5 to 8 in.	10s a 15s
Seychelles, 3rds...	Lean & dry to mid. under 6 in. ...	7s a 10s
Madagascar, 4ths,,,	Low, foxy, inferior and pickings,,, ...	3s 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for April :—

ARTESIAN WELLS.

THE most favourable condition which renders artesian wells possible is a basin-shaped arrangement of porous and impermeable strata. The surface water flows along the line of dip down the porous strata till the latter become as it were surcharged like a sponge ; so that if a boring were made down to a water-bearing stratum of this character, the water which had no means of rising through to the impermeable stratum above it, will owing to the hydraulic pressure gush out at the surface. The following examples are given by Prof. Geikie to show the great depth to which artesian wells may be sunk : at Grenelle (Paris) the water rises from a depth of 1,771 feet ; at Neusalzwerk, near Minden, the depth is 2,394 feet; at Louisville in Kentucky, 2,086 feet; at St. Louis on the Missouri, 2,624 feet. The hydraulic pressure under which the water is forced to the surface is often very great. At Grenelle the fountain ascended at first 112 feet, at Louisville 170 feet. The continuity of the typical underground basin may be interrupted, and in many cases artesian wells merely tap underground waters which would otherwise find an outlet to the surface as junction springs.

The advantages of artesian wells are thus set forth by Mr. Tousher of Malmesbury, who undertakes to bore and drill artesian wells :—

1. Because they are bored to such a great depth, the depths of the deepest wells being insignificant. 2. Because they can be bored and drilled through strata where it would be impossible to dig, for instance quicksand. 3. Because there is no necessity to stop at the first water obtained, as is the case in dug wells, but that if the first water should be brackish or impure, it can be completely shut off, and the boring proceeded with until the next water-bearing stratum is reached, and so on. 4. Because the water obtained is always pure, as the artesian well does not allow any contaminated water to come in, while the water in a dug well is always more or less impure, as, being drainage water, it will always permit decomposed matter to percolate into the well. 5. Because the water is always copious and unfailing, being drawn from the underground strata, while the water in a dug well is always directly dependent on the rainfall. 6. Because they are almost everlasting, not being liable to tumble in like a dug well. 7. Because there is no danger attached to them. 8. Because they are cheaper. 9. Because they can be bored from the bottom of any dug well, no matter how deep, and whether it contains water or not, and without in the least interfering with present arrangements ; thus saving the expense of boring to the depth of any existing well at any place. Mr. Tousher as an interested witness to the advantages of artesian wells, it may be thought speaks too disparagingly of dug wells, but it must be admitted that his remarks are in the main well founded.

Mr. Henry Penning of the Geological Survey of England and Wales, writing on this subject, says that the water supply of a district is not by any means proportionate to its rainfall—the water-bearing beds being great distributors that equalise the supply. The supply to be obtained by boring down to a deep-seated spring, is, he says, practically inexhaustible, being rarely, if at all, affected by drought, and these springs form the only source on which can be placed a full reliance. Referring to the light which geology throws on the question of water-supply, Mr. Penning says "An improvement in the water-supply of a district is one of the practical results that may be expected to arise

from the working out of its geological structure—that is, from the knowledge obtained of its rocks and of their relation to each other. The phenomena of springs and the sources of supply to artesian wells are so entirely dependent on stratigraphical and physical features, that an acquaintance with their principals cannot fail to be of use to the student of field geology. . . . .

It follows that when all the condition of dip, permeability and continuity are known, it becomes a matter not of speculation but of certainty to estimate the depth at which water will be found, and the height to which it will rise in a well."

With rumours of a geological survey and of artesian wells, the despondent agriculturists of our drought-stricken districts may well gain a little courage!

OCCASIONAL NOTES.

A correspondent writes with reference to the yield of Arekanuts:—Now that attention has been called by you to the cultivation of arekanuts, and a question raised as to the income derivable from this product, it may be interesting to you and your readers to know that 50 cents per tree is by no means a high average—that is to say where it is cultivated as it should be. The safer valuation of 25 cents per tree, to which some well-informed people would incline, may be based on the experience gained by natives from the produce of their *arambas* or groves. But then these arambas are invariably planted so closely, that the plants do not get sufficient feeding ground and sunlight. The consequence is that they get attenuated, reaching a great height and yielding individually but a small crop. Let the plant stand 12 feet apart between the rows and far enough in the lines to enable the pluckers to go from one tree to another without descending and thus making the harvesting of the crop an expensive work, and it will be found that the plants in ordinarily favourable situations, will come into bearing so early as at 5 years, and that they will yield more than twice the crop obtained by the natives, who plant them among *jak, kitul* and other such garden products, along with which the areka has to share the enjoyment of sunlight and soil. I have counted up to 300 nuts in a bunch, though, I am told, a maximum of 500 may be reached. The price of arekanuts is about from 75 cents to a rupee per 1000, and you should not think it too much to expect from 500 to 1000 nuts to a whole year's crop. However, if you obtained only 25 cents per tree, still, with 600 or 700 trees to the acre, it will be no mean product.

The Kew Bulletin for February contains a note on Kath or Pale Cutch. This substance also known as Pale Catechu is prepared from *acacia catechu*, and is to be distinguished from cutch or catechu, and from gambier which is sometimes called Pale Catechu. Pale cutch is the substance used all over India and in Ceylon for mixing with betel leaves &c. for chewing purposes, and is known in Sinhalese as *Caypoo*. Catechu is used in medicine, especially Veterinary medicine, as an astringent, and the catechu of Burmah (poor in catechin) is exported to Europe as a dye stuff. Pale catechu or Kath when pure consists chiefly of catechin, a chrystallising substance nearly insoluble in cold water, and which must not be brought in contact with iron. Its preparation is a long and tedious process, as the extract got from boiling the wood-shavings of *acacia catechu* has to be brought to a high degree of concentration and left to stand for a long time, till the catechu is got to chrystallise out of the catechu tannin, with which it is found mixed. The preparation of the dark catechu which consists chiefly of catechu tannin, is a much simpler process, and is merely a boiling down of a watery extract of the wood of *A. Catechu* and *A. Suma.* Pale catechu or Kath and Gambier have been pointed out by Flückiger and Hanbury to agree in composition, both consisting mainly of catechin (*Catechucic acid*). As Pale catechu so closely agrees with gambier, which is now in great demand, it is surprising, thinks the Kew Bulletin, that it is not exported to Europe, where it would be readily accepted by the dyers as a substitute.

The word *Catechu* is considered by some writers to be a modern Latin derivative from the South Indian name *Kachu*, and that from South India the product was first exported; while others derive it from the Cochin Chinese word *Caycan*, which is no doubt connected with the Sinhalese *Caypoo.* The Sanscrit authors mention the drug, and Barbosa in 1514 notices what is in all probability is this drug under the name of *Cacho.*

It is interesting and sometimes amusing to read the opinions of old writers on Ceylon regarding the agricultural capabilities of the Island. Sir Samuel Baker, like the promoters of the late Model Farm at Colombo, committed a huge mistake when he attempted to start farming in Ceylon upon the lines he choose to work on, and in both cases the projects resulted in signal failures. No doubt Sir Samuel wrote with a prejudiced mind when he condemned in such general and emphatic terms the soils of Ceylon, for their extreme poverty. In his book entitled "Wanderings in Ceylon" there are, however, observations and suggestions which prove that the author had evidently carefully examined into the needs, and considered the means of improvement of the natives of the Island. He refers to Mr. Thurston's Industrial School in the Cinnamon Gardens of Colombo, on the site now occupied by the School of Agricultnre, and suggests that the Government should develop the plan upon which that establishment was worked, so as to bring an agricultural and technical education within the reach of the masses, and specially advices that an improved system of cultivation should be introduced to the natives, and that new products should be brought to their notice. So far as the suggestions referring to agricultural education are concerned, Sir Samuel Baker's advice has been acted upon, while there is also a move to give effect to his suggestions regarding technical education. It is not of course to be considered that these results have been brought about by Sir Samuel Baker's work, but it must be admitted that the author had studied the condition and requirements of the people of Ceylon, at a time when few—the Government excluded—were sensible to the fact that there was a reform to be worked, which remained for Mr. H. W. Green to initiate.

The idea of having small tracts of land attached to schools about the country, so that each school may have its own experiments in agriculture, has been carried out to a considerable extent. The "narrow policy of Government" with regard to salt, which of late has been much discussed, is condemned by Sir Samuel Baker in strong terms, among other reasons for impeding the preparation of hides. The chief obstacle in the tanning industry in Ceylon is now however not so much the high rate of salt as the difficulty in procuring hides. Of the natives we are told that they never stint time and trouble where the prospect of money is safe; and with this remark we quite agree, though we were understood (wrongly) to think otherwise, from our remarks on native enterprise in a previous issue of this Magazine.

Dr. Trimen's Administration Report for 1890 is out early as usual, and is as full and interesting as previous reports. Under the heading of "Economic Plants" we find that the acquisition of the true gambier *(Uncaria Gambier)* has, after many failures, been at last accomplished. "It is clearly," says Dr. Trimen, "very fastidious and difficult to propagate, but it ought to succeed in our hottest and wettest districts. Naturally an extensive climber, it is in cultivation kept down by cutting so as to form a low bush of 5 or 6 feet. With Cubebs (*Piper Cubeba*), however, Dr. Trimen is unable to report any progress, and the plant "still remains a desideratum." There is also a note on Chinese ginger, which in our last issue, we reported as having been identified with *alpinia galanga*, the well-known "Kaluwala" of the Sinhalese. "It is a little difficult to believe," says Dr. Trimen, "that the 'preserved ginger' of commerce is the produce of the same plant, especially as the rhizome has not the appearance of the commercial article: and I cannot help suspecting the possibility of a mistake having been made when originally sending the plant to Kew." Since, however, the identification of the plant has been accepted as correct by the authorities at Kew, it is only to be supposed that by careful selection and cultivation the original *alpinia galanga* has to some degree been metamorphosed into the "preserved ginger" plant of China.

In the report of the Saidipet Experimental Farm for the year 1879, is a note on the poisonous qualities of the grain known as *Amu* in Sinhalese, and *Varagu* in Tamil. This is one of the fine grains cultivated in the chenas of Ceylon, the seeds of which are small, black and shiny. Sometimes the effect of eating this grain is followed by a feeling of giddiness and prostration—in fact all the symptoms of poisoning evince themselves. In the absence of proper treatment, in some instances, the result has been the death of the consumers. In the villages of Ceylon, however, the people have a very simple remedy derived from common herbs, which counteracts any evil results from eating *amu*. Mr Wilkins, the Botanical lecturer at the Madras School of Agriculture, says that the poisonous grain is not the product of any particular variety, but of plants that yield the healthy grain; and bad seeds may produce wholesome grain. He has not been able to discover anything in bad grain that can account for its poisonous principlos. A number of instances have been recorded in India of the bad effects of this grain on man and cattle. It is generally held that grain raised at the proper reason is wholesome, but that raised on the samo ground as a second crop, and that raised on wet marshy ground, are both unwholesome. Dr. Bonavia's opinion is that after rain, when the ear is ripening, a fungus attacks it, and it is the fungus which does the mischief. This reminds one of the case of rye and other cereals and grasses, which are rendered unwholesome by reason of the attack of the fungus known as ergot (*Claviceps purpurea*) which has caused the death of many hundreds of people on the Continent, and innumerable cattle in England. Dr. Bonavia states that washing the grain well before cooking renders it harmless. Dr. Macræ, late Chemical Examiner at Madras, did not think that the wholesome could be distinguished from the poisonous grain: but he observes that when a sample of bad grain was "placed in an air-tight chamber and exposed to the influence of air and water, some of the seeds germinated in three days, while a plentiful crop of what (MICROSCOPICALLY) appeared to be ordinary mould was developed." It will thus be seen that nothing certain appears to be known regarding the poisonous principle in *amu*, and that it is very desirable that further observation and experiment should be made so as to throw further light on the subject.

FURTHER NOTES ON GINGER.

By W. A. De Silva.

In my last contribution on ginger, I mentioned the method of cultivation of the true ginger, and its preparation for market for use in medicine and as a condiment. Ginger also finds its way to the market in the form of *"essence of ginger,"* which is used largely in medicine. We also come across ginger in a preserved state. Preserved ginger is largely exported from the Chinese ports, and especially from Canton. In the January number of the Kew Bulletin, an account of the Chinese ginger plant is given, and it has been ascertained that the preserves are not manufactured from the true ginger, but from a rhizome obtained from another species of plant allied to the ginger. This has been accepted to be *Alphinia Galanga*, the *Kaluwala* of the Sinhalese. It has also been found out that Siam exports a species of ginger obtained from the rhizomes of a variety of *alpinia* known as *A. Zingiberina*, which is, however, not essentially distinct from *A. Galanga*. The rhizomes of the alpinias possess in addition to the characters of the true ginger an aromatic smell, and they are not so pungent as ginger. In Ceylon we find in addition to the *A. galanga* the supposed Chinese ginger, some other varieties of alpinia very similar to *A. galanga*: these are the *A. allughas*, Sin. *alugas*. *A. nutans*, S. *Rankiria*, and *A. Calcarata*, S. *Ketakiriya*. The rhizomes of all these possess the characters of the Chinese ginger, *A. galanga*.

Chinese ginger in a preserved state does not possess the characteristic [aromatic taste or smell present in any of the alpinias. This may

evidently be owing to its being lost or modified when prepared into a preserve.

Anyhow it is certain that the Chinese preserved ginger is quite different from *Zingiber officinale*. When ordinary ginger is preserved it can never be made to possess the characters of the imported preserves. The taste, size, and texture of the rhizome always differ much, and the true ginger, when preserved, is found to be of a very pungent taste and of a harder texture than the Chinese preserve. If then the Chinese preserves are made from the *A. galanga*, the Sinhalese *kaluwala*, there is a fair prospect of opening a new industry in Ceylon, as the plant seems to thrive well in the southern parts of the island, as well as in Kalutara, so far as I have seen. The only use which Kaluwala is put to by the Sinhalese is that of chewing the pungent and aromatic flowers of the plant along with betel, these flowers resembling cardamoms in taste. The rhizome is only occasionally employed as a medicine. The following is said to be the method adopted in China in making preserves of ginger:—Soon after the rhizomes are dug out they are washed clean, and after the outer covering or the epidermis is scraped off, rewashed, and kept in water for twenty-four hours. They are then taken out and are spread on a board, the portions which are in any way discoloured or spoilt being removed. Then the whole is pricked with forks which are made specially for this purpose. After having undergone this operation, the ginger is washed again and exposed to the sun till the water is evaporated. Next the rhizomes thus prepared are mixed with sugar and boiled for fully two hours. They are then placed in earthenware pots for a few days, after which they are subjected to the same process of boiling with sugar for a second time. This being the final operation, they are packed in small vessels and sent to the market.

LAWS OF CEYLON RELATING TO AGRICULTURE.

Ordinance No. 23 of 1889.

II. An Ordinance relating to the Irrigation and Cultivation of Paddy Lands.

[This is a consolidation of all the previous Ordinances on the subject, together with some amendments.]

CHAPTER I.

"*Proprietor*" means owner of paddy lands, and includes the cultivator or person in actual possession of any such land.

"*Occupant*" includes a person having the charge, management or control of any land or premises.

"*District*" means any korale, pattu or village, or any other subdivision of a province, which may from time to time be defined by the Governor by Proclamation in the Government *Gazette*.

"*Grain tax*" includes the tax, duty or share due to Government in respect of grain grown in this Island under any of the following Ordinances:—No. 14 of 1840, No. 29 of 1865, and No. 11 of 1878.

For the purposes of Chapters VII. and VIII. "majority of proprietors" means a majority consisting of two-thirds at least of the proprietors present. Provided that such majority shall represent at least one-third of the acreage benefited by such irrigation works, and if they do not represent one-third, then the votes of the proprietors representing two-thirds of the acreage to be benefited shall constitute the majority.

CHAPTER II.

1. There shall be a Board, consisting of the Governor, the Surveyor-General, the Director of Public Works, and such other persons as the Governor shall from time to time appoint, of whom one at least shall be an unofficial member of the Legislative Council, to be styled the Central Irrigation Board of Ceylon. In the absence of the Governor, the senior official member present at any meeting of such Board shall preside thereat.

2. In each province there shall be a Board to be styled the Provincial Irrigation Board, consisting of the Government Agent as President, the Provincial Engineer of the province, and such other persons as the Governor may appoint.

3. The Colonial Treasurer shall pay annually as soon as may be after the first day of January, into the irrigation fund, a sum equivalent to one-fourth of the grain tax collected in the several provinces during the preceding year; such irrigation fund shall be vested in the Central Irrigation Board.

4. Moneys voted by the Legislative Council for irrigation works shall be paid into the Irrigation fund.

5. The Central Irrigation Board shall prepare an estimate of sums to be apportioned from the irrigation fund to the provinces. Estimated apportionment to be laid before the Legislative Council.

(*a*) Provided that a sum so apportioned to any province may, if necessary, be re-apportioned; sums so re-apportioned shall be included in the annual report of the Board.

(*b*.) Provided also that sums not voted by the Legislative Council for specific purposes shall be apportioned or re-apportioned to each province.

6. Reports of Irrigation Boards shall be annually submitted to the Legislative Council.

7. All acts required to be done by the Irrigation Boards shall be done by a majority of the members of such Boards. The President shall have a casting vote.

CHAPTER III.

1. (*a*.) The Governor in Executive Council may proclaim irrigation districts.

(*b*.) The Government Agent shall call a public meeting or meetings (where more than one are required) for the purpose of determining whether this Ordinance shall be carried into operation with the aid of headmen or of Village Councils or of both.

2. Public notice of such meeting shall be given at least one month before the day fixed for the meeting, calling upon all proprietors within any district or division to attend in person or by proxy.

3. (*a*.) Every meeting so convened shall be held at the time and place appointed, in the

presence of the Government Agent; every proprietor within such district or division for which the meeting has been called shall be entitled to vote.

(*b.*) The Government Agent shall explain to them the provisions of the Ordinance.

(*c.*) The proprietors at such meeting shall appoint a Committee of not more than twelve, nor less than three persons, to be associated with the Government Agent for the purpose of carrying out the provisions of this Ordinance, and for advising him in matters connected with the irrigation of the district.

(*d.*) Where more meetings than one are held, each division shall be allowed to appoint its proportion of the Committee to make up the number for the entire district. When any members of the Committee die, or leave the district, or refuse to act, the Government Agent may appoint others in their stead.

(*e.*) The questions and resolutions proposed at any meeting, and the number of votes given for and against the same, shall be recorded in the Minutes of such meeting, and shall be signed by the Government Agent. The said Minutes shall be deposited in the provincial or district Kacheheri, and copies thereof, certified by the Government Agent, shall be transmitted to the Colonial Secretary.

4. All questions as to the right of any person to vote shall be decided by the Government Agent. Such question and the decision thereon shall be entered in the Minutes.

5. A majority consisting of two-thirds at least shall decide all questions or resolutions passed at any meeting.

6. The Government Agent may make rules in districts where proprietors cannot publicly meet.

7. All acts committed contrary to the customs and rules, and all complaints relating to matters provided for by this Ordinance shall be investigated and dealt with in manner provided in Chapter IV. or Chapter VI. according to the nature of each case.

H. A. J.

(*To be continued.*)

THE GRAPE VINE.

(*Vitis Vinifera.*)

4. *Soil and Climate.*—The Vine will thrive best on light soils that have a dry bottom. In such as are rich and deep, it will grow luxuriantly and produce abundance of large fruit. In shallow dry gravelly soils, it will produce less fruit but of better flavour. It grows well in the north of the Island where the soil is generally shallow and dry and lies on calcareous rock. The red sandy soils of Jaffna called *Chempadu* would grow good grapes for wine-making. Retentive clays are the worst soils for the vine. As it wants a very dry soil, it will be advisable to drain the land well where it is not sufficiently dry by nature. The bramble has been found to correspond to a great extent to the vine; and therefore any soil where the former grows freely would be good for the latter. We are growing some vines on such a soil here at Happy Valley, by way of experiment; but as yet I cannot write with much confidence about them, as the plants are still young.

A warm dry climate is best suited to the vine; and if we want to lay out a vineyard we ought to select a site freely exposed to the sun, especially to the morning sun. The dry hot districts of Jaffna in the north and Hambantota in the south will grow good grapes. As to the fitness of the former place there can be no doubt, as it has been practically proved by our Jaffna gardeners from the late Government Agent Mr. Dyke downwards. Grapes might also be grown with advantage in or near Chilaw, Puttalam, Mannar, Trincomalee, Batticaloa, and parts of Uva. There are indeed several other places in Ceylon where fairly good grapes can be grown for the table, by expert gardeners; Wahakotte, which I mentioned in the last instalment, being one of them. But of course where the requirements of climate and soil do not come up to the proper standard, no grapes suitable for making wine can be produced, as those grown in such places would be too deficient in saccharine matter.

5. *Propagation.*—There are at least four ways by which the Grape Vine is propagated, viz., by seed, layers, cuttings and grafting.

(1.) *By Seed.*—The vine may be propagated by seed produced by cross-fertilization for the sake of obtaining new varieties superior in the size of the bunch and berry, in flavour and delicacy, or in point of hardiness and productiveness. But as yet grape-culture in Ceylon has not advanced to such a degree of developement as to call for propagation in this way.

(2.) *By Layers.*—By this method large showy plants can be procured that will soon come into bearing. Loudon recommends the following plan for propagation by layers:—"At the pruning season leave a shoot of strong wood, over and above what may be wanted for training, of a sufficient length to bend down to any convenient place where a pot can be placed to receive it as a layer; and also for training it during its growth. When the vine begins to push, displace all the buds from the shoot intended for laying, except the leading one. When this is grown to about 8 inches or one foot in length, bend it down to the pot and lay it so that the top joint whence the wood has sprung, may be fixed with a strong crook at about one inch under the surface of the mould. As soon as it begins to take root, which may be known by removing a little of the earth, begin to weaken its resources from the mother plant, by making an incision in the wood behind the pot. Deepen this incision by degrees, as fast as the young plant will bear it, until it be quite separated from the old one."

(3.) *By Cuttings.*—This is the most convenient method for us in Ceylon where, generally speaking, Viticulture is yet in its infancy. The advantages of propagating by cuttings are simplicity of operation, economy in labour, and economy in the wood or shoots to be propagated from. The cuttings should be one foot to 18 inches long, and should be planted sloping-wise so as to leave only two eyes above ground. They may be first set in a nursery or in baskets and shaded till they strike, and then planted out after they have grown sufficiently.

(4.) *By Grafting.*—Delicate vines of superior variety can be grafted on stocks of hardy kinds,

and thus the desirable qualities of both can be preserved. This is about the best use of this mode of propagation. 'Grafting by approach,' in which the complete separation of the scion from the parent is effected after the former has begun to draw sap from the stock, recommends itself as the surest method. The best time for grafting is when the vine breaks into leaf after pruning and the shoots have grown about two feet.

E. T. Hoole.

Haputale, 18th March 1891.

(To be continued.)

AGRICULTURAL LITERATURE AMONG THE ANCIENT INDIANS.

By W. A. De Silva.

The Rishis and Pandits of India who flourished during the earlier ages cultivated many a branch of science met with in the present day. Astronomy, chemistry, planetology, medicine, &c., formed themes for many a volume. The ancient Hindus were great observers of nature, and no branch of Natural Science escaped their observation, and the phenomena of nature they tabulated and wrote treatises on, mostly in verse; this being more adapted for the system of learning (committing to memory) then in vogue.

Printing was an unknown art then, and copies of these great works were possessed by only a few, either pupils of, or descendants of, the authors. Copying was attended with great difficulty, and the language and style was such that a single omission or addition of a letter or syllable was sufficient to greatly alter the original ideas.

It must be admitted that there are a good many incongruities in the writings of these ancient philosophers; but while some of these may have occurred in the original works, there is no doubt that many must have crept in in the frequent process of transcribing the treatises.

Some of the observations on the cultivation and treatment of different products may appear absurd to the modern agriculturist, but there is on the other hand a good deal on the subject of Agriculture that quite corresponds with modern theories and practices.

I shall notice here some observations on gardening given in the Brihat Samhita, an ancient Sanscrit work by Varahamira, who is said to have lived in the fourth century of the Christian era.

Varahamira, in the introduction to his work says:—"Having examined the vast works that have proceeded from writers from the time of Brahma downwards, I purpose to write a brief work embodying the substance of the same. The task is a pleasing one to me." In this work he has devoted a chapter to Agriculture, and from the above passage it is clearly seen that Varahamira's work was not composed of original information, but was compiled from other ancient works.

In this work, the soil and its preliminary treatment is referred to as follows:—"Soft soil is congenial to the growth of all trees; such a soil should be selected for the garden, and the sesamum plant (gingelly) should be first grown in it; as soon as the plant begins to bear blossoms it must be cut down."

The first priece of advice given here, that of growing gingelly on the soil and destroying it just as it flowers would appear to be absurd to those who are unacquainted with scientific agriculture. But this is evidently intended to prove the necessity of manuring, and to show that green manure is useful in a soft soil, and besides points out the principles of green manuring, by advocating the growth of a pod-bearing (in this case not leguminous) quick growing plant, with succulent leaves and stem, containing a good percentage of nitrogenous matter. The time of cutting down the plants is also rightly given,—"just as they begin to flower." In fact no better plant adopted for green manuring, and no better method could be advocated.

Then follows two passages in which certain directions are given regarding the propagation of plants. The first gives the names of some of the principal trees which are grown from seeds; the second runs as follows:—The jak, the asoka, plantain, jambu, breadfruit, pomegranate, vine, citron, &c., should be grown by planting either their roots after clipping them, or their branches smearing cowdung on the parts cut."

The above trees are more or less successfully grown by division or by cuttings, and the recommendation to smear cowdung on the parts cut is an excellent one, through the neglect of which many failures occur at the present day. It need not be cowdung, but any substance to prevent the rapid evaporation of the sap and the rotting of the parts cut that should be used.

Speaking of the best seasons for growing certain plants the author says:—"Trees that grow without branches shall be grown in Sisira season; and in the Hemanta shall be grown trees that grow without branches; in the Vasantha season shall be grown trees possessing good trunks. The year is divided into six seasons by the Indians, each consisting of two months, thus, the Sisira season extends from the middle of December to the middle of February; Hemantha, from October to December; and Vasantha from February to April."

Then the author proceeds to give the space that should be left between plants; this is of very great importance, seeing the neglect of this important operation among our native agriculturists, though they were taught by their ancient and honored philosophers to adopt a suitable plan. The passage runs as follows:—

"An interval of twenty cubits between trees is the best, one of sixteen is passable, and one of twelve is injurious."

"The trees that are planted very near each other get their branches interwoven as well as their roots, and such trees get choked and do not grow well."

The importance of irrigation and the desirability of watering trees whenever the soil is dry is forcibly laid down; and the names of some of the trees which thrive on wet soils is also given; among the list we find jambu, rattan, nauclea, pomegranate, vine, emberalla, jak, &c.

I shall reserve for my next a notice of the cause and treatment of plant diseases and of special manures and preparations which produce variations in fruiting, growing, &c.

BUILDING MATERIALS.

SECTION II. TIMBER *(continued)*

By A FACTORY APPRENTICE.

It very rarely falls to the lot of the Architect to select timber whilst in a state of growth, but if such a need arises, he will, of course, choose healthy vigorous and flourshing trees. Preference should always be given to those in which the trunks are most smooth, since a swelling above the general surfaceis a sure sign of decay. That the condition of the roots of a tree is the best index to its soundness is well known, but yet dead branches, especially on the top, render it very suspicious. In felling trees the large branches should be first cut off, so that the tree may not be injured or strained in its fall, and the trunk sawed as close to the ground as possible. When felled, but not before, it has to be barked, trimmed of its branches, and left to season. Before, however, leaving it for this purpose, it is thought best by workmen to square it to prevent its tendency to split.

The pieces selected for building should possess straight grain, but there are pieces which are occasionally employed, for instance for knees and braces, wherein a curviliner direction of the fibres is extremely desirable. It may be generally stated that in the case of two equal-sized and seasoned pieces the heavier is the piece to be preferred.

The boughs and branches are never so good as the body of the tree; the larger are stronger than the small limbs, and the wood of the heart stronger than all. When green, wood is not so strong as when thoroughly dry, which it rarely is till two or three years after it is felled. Timber that contains much sap is not only weaker but decays sooner. Timber is weakened by knots at which by experience it is found that fractures most frequently occur: and it is important to the Architect to recollect that he should always reject cross-grained pieces. The life of trees, like that of men, has been commonly divided into three stages: youth, maturity and old age. When a tree has arrived at a mature age the proportion of sap-wood is small and the heart-wood is nearly uniform, and is hard, compact and durable, and this is the proper stage for a tree to be felled. A tree when felled in infancy contains a great deal of sap-wood; when not felled till it is on the decline, that is, till it reaches old age, the wood is brittle and devoid of elasticity, tainted, discoloured and soon decays.

In order that timber may be durable, not only is it necessary that it should be felled during maturity, but due attention ought also to be paid to the proper season of the year for felling.

(To be continued.)

PADDY CULTIVATION IN THE NORTH.

SIR,—Will you allow me through the medium of your Magazine to make certain suggestions with regard to paddy cultivation in Jaffna?

It is generally known that paddy cultivation in that place has proved a total failure during the last three years, and I think we may safely fer in that there is very little hope in the future of a successful crop there. The usual nature of the seasons seems to have changed, and there appears to be a tendency towards a lengthening out of the dry and a shortening of the wet season.

The average paddy crop in Jaffna is undoubtedly a poor one. True, there have been cases in which good crops of paddy have been reported, but the figures meant to denote high yields refer only to special cases, where a very small extent of land, on which more than the ordinary treatment and attention has been bestowed, is cultivated. I am led therefore to think, and that not without reason, that paddy cultivation in Jaffna cannot be a success. How then can Jaffna hold its ground? I say let it look to that which thrives in the North.

The fact that Jaffna has long been famous for its fruits and dry grains, such as peas, gingelly, chillies, varaku, kurakkan, maize, &c. cannot be denied. Grapes and mangoes, oranges and pomegranates are unrivalled for their quality. Good mangoes in Colombo are identified with Jaffna mangoes. Mr. Green, the indefatigable promoter of agricultural knowledge in the Island has in his Agricultural Primer rightly suggested the extension of fruit culture, as well as encouraged the cultivation of dhall in Ceylon. Jaffna ought to lead the way in carrying this advice out, especially as its soil suits the cultivation of fruits of superior quality and of leguminous plants.

The digging of wells in the usual way in the midst of every cultivator's land is essential to a place like Jaffna, to water his crops whenever the rain fails. I will not speak here of novel experiments such as the boring of artesian wells, which has engaged the public attention for some time past.

New implements of culture are notfor the most part suitable to the Jaffna soil, which is of a shallow limy nature, but there is nevertheless room for improvement in Jaffna. I would suggest that the cultivators should cultivate paddy and dry grains alternately, and give more attention to the latter—that is to say they should practise a simple rotation of crops. A rotation is carried on there to some extent, but in no systematic manner, and I propose that dry grains be cultivated, in turn, thoughout one whole year.

Hitherto dry grains were looked upon as something secondary, but in fact, they are of primary importance in Jaffna, and ought to be considered such, as the *dry* season is predominant there. The Jaffna farmer has hitherto considered himself to be the cultivator of paddy, and to cultivate it was his chief aim and ambition. Hereafter his chief object must be to engage himself in the cultivation of dry grains (which is sure to remunerate him amply) and not to waste his time, strength and capital in his vain endeavour to secure a few bushels of paddy each year. The dry season is sure to come every year, but the wet season, almost as a rule, disappoints him. Therefore, he ought to ponder over these facts and betake himself to a more extended cultivation of that species of grain which is suited to the conditions of soil and climate in this district. By doing this Jaffna will find itself in a better position than now, and by gradually dropping the cultivation of paddy, will in an indirect way, help to abolish the paddy-tax!

R. M. C.

GENERAL ITEMS.

Mr. T. W. Goonewardene, Agricultnral Instructor at Kolonna, writes:—Kolonna is a small village situated fifteen miles to the east of Rakwana, and consisting of about sixty dwelling houses surrounded by hills on three sides. The average temperature may be fixed at 82°, and the rainfall, as calculated last year, 50·38. The small rainfall at present is no doubt partly traceable to the destruction of the forests for chena cultivation. The inhabitants depend mainly on kurakkan, and, to a smaller extent on paddy. They devote most of their time to chena cultivation, owing no doubt, for one reason, becsuse it is less troublesome than paddy cultivation. Parangi and fever, whether due to the common diet of dry grain and elk's flesh or other causes, are very common among the people. Both clayey and sandy soils are found in the district, and these overlie a dolomitic limestone formation which is seen on the sides and bed of the river. The natives burn this limestone and prepare lime for washing their house walls. There was hardly any rain during January last, and the drought coupled with the prevalence of fever makes it hard to carry on any experimental cultivation on a large scale. There is also no tank to which we can look for water to irrigate the fields during the dry seasons. There are only two tanks in the korale, one near Maduwanwela Ratemahatmeyas' residence, the other at Hulandawa. The R. M. is doing much philanthropic work, and the poor and afflicted inhabitants owe much to him as well as to Dr. Vethecan. I have been engaged in preparing a piece of land for the cultivation of dhall, which I shall endeavour to popularise among the inhabitants as a nutritious food.

Mr. Juanis writes from Nildandahinna. The weather at present (March 3rd) is very warm, there having been no rain for two weeks past. This sudden drought and heat is most inopportune, and not having been calculated on, is doing much harm to the young crops, especially those in hilly places where it is so difficult to water them by the hand. If there is no break in the weather before long, and the drought holds out for a month or two, the paddy crop must prove a total failure, and the people must look for bad times owing to short food supplies. The dhall and arrowroot I planted are holding out well, under adverse conditions.

Mr. Jayasuriya, head-teacher Walapane, sends a translation of a curious "disquisition on water" from the "Yoga-arnawa" of Meyrupada, an eminent and learned priest who lived in the reign of Prakrama Bahu III. A. D. 1267:—

Of all waters rain-water is the best—it is light, promotes appetite, destroys the three *dos* (viz., bile, phlegm and wind), and is an antidote for poison. The same when it enters into the earth, wells, &c. acquires different tastes and loses much of its virtue. The water of rivulets is tasteless, but it produces flatulency; that of lakes is sweet and light; that of tanks prevents both phlegm and flatulency, that of ponds promotes flatulency, that of pools is tasteless and induces hunger, that of waterfalls and rapids is light and destroys phlegm, that of wells promotes hunger and flatulency, that of water springs destroys bile, and that which proceeds from mountains, washing them in its course, as well as that contained in natural lakes, causes pulmonary diseases, affections of the head, boils in the necks, &c. River-water which flows eastward is light, and that which proceeds westward is heavy; the same if in a muddy locality is heavy, but in stony places is light. The water of a first shower of rain, by reason of its coming in contact with dry organic matter, and engendering worms and insects, produces coughs, cold, asthma and inflammations. Rain water should not be used during autumn, since it is said to fall on account of serpents. But above all, let not water teeming with animalculæ or filthy water, or water mixed with *sevel* (Valisneria) in stagnant pools, or water which has seen the light of neither the sun nor moon, be used.

The following answer is given to a correspondent to the Agricultural Journal of Cape Colony who puts the query, "Has the Banana seed, and can it be propagated from seed as well as from the tuber? Also at what age does it begin to bear?":—

Answer.—The Banana, like most plants cultivated from time immemorial, has altered enormously from the wild form. There are dozens of varieties; and the ones most prized are those absolutely without seeds. Obviously such plants can only be propagated by vegetative method, analogous to cuttings, suckers, layers, &c. The custom is to allow the stem of the year to ripen its fruit, then to cut it down a little above the ground. A little mulching of old banana leaves is heaped loosely at the base, and in a few weeks new shoots spring up from the side of the old stool. The largest of these shoots has been known to show bloom in the third month after appearance above ground. But if the major part of the old stool is cut away and the root mass or rhizome be transplanted, it will not show fruit till the tenth and eleventh month. Some varieties of Banana, however, have seed. Finlayson, in his Siamese Journey, found examples of cultivated bananas with a few seeds, and mentions a wild sort full of seed, but deficient in pulp. (Journal Voyage to Siam, London, 8vo., 1826, p. 56.) Meyer describes the "Plantano de Pepita," in the Island of Luzon, which though propagated as usual by shoots from the rhizome, is full of fertile seed, and is good eating.

Practically, at the Cape and Natal, shoots are the only mode of propagation. Even if seeds were obtained the result would be unsatisfactory, as the seedlings would be sure to "throw back," or revert to the wild state, more or less. This custom of using seedlings of orchard trees for fruiting, instead of for stocks to graft on, is ruinous to the character of Cape fruit, and accounts for our mostly tasteless apples, our leathery peaches, and thick-skinned oranges. I have known a banana shoot bear in the third year, but it is mostly a question of climate.

An excellent remedy for hoven in cattle is said to be carbonate of soda. The soda—one ounce—must be given in a bottle of warm water and *slowly* poured down the throat. This is recommended even for horses.

THE

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TEA AND COFFEE IN CEYLON.

UPS AND DOWNS—CONTRADICTORY EXPERIENCES—FARMING VICISSITUDES IN ENGLAND.

LAST mail brought us the following pertinent criticism and enquiries and interesting notes from a Ceylon proprietor now at home. They will be read with attention by planters, especially the information given about farms in England :—

" The *Ceylon Observer* of the 5th Feb. has been my study today, and I am much struck with the conflicting accounts of the tea and coffee industries. Why should the proprietors of Brae group part with their apparently valuable property for £4,500, when the Yatiyantota Company can pay 25 per cent dividend ? Unless I am much mistaken Mr. Hugh Fraser was specially complimented in your columns of the *Observer* on his good fortunes in Brae ?* Again in Haputale bug is reported to be disappearing and some quite phenomenal crops are reported—thousands of bushels in fact. Accounts from Madulsima however show that bug is *very* bad on the small acreage of coffee left. A similar report comes from Udapussellawa.† Wilson and Smithett have just sent me a sample of some ——— (Uva) peaberry which made 136s per cwt. This is 9s. over the highest price, which ——— (Uva) coffee ever made, when comparatively healthy. From what my manager says, however, I cannot think that coffee will ever pay for money bestowed upon it. A crop is a mere chance.

"Cinchona seems to have become like a broken reed—and no wonder, when quinine is quoted at 11d per oz.! I believe chemists still charge from 3s 6d to 5s. When do you think that we shall have a railway into the heart of Uva ? Is it not nearly 20 years since the first agitation ? Enough to break *stout* hearts."

[Yes indeed : our first Memorial was in 1872, but our correspondent will be glad to hear that the line—not merely to Haputale, but to Bandarawala with a new and fairly level road to Passara—should be open by September 1892.—Ed. *T. A.*]

"What very poor prices, they seem for estates in tea compared to the prices paid for coffee estates in our prosperous days, such as Monaragala £70,000, Wallaha £27,000, old Sylvakande £15,000, Alice Holt Group £75,000, Ceylon Plantations Co. Group £50,000, Doomoo £14,000, Forest Hill ditto, Yapame £18,000, and jungle at R280 per acre !

"All I can say is that these vicissitudes are not peculiar to Ceylon. The finest grazing land in England can be bought at about £30 to £40 per acre—very often 20 years purchase on the reduced rents—and land in Essex is at this present moment abandoned. It is like a jungle, and homesteads and cottages are falling into ruins.

"I have just been over a farm of 88 acres in this county which let at £150 and £130, and the rent is now £60 per annum. The outgoings are about £30 p. a. The craze is laying down land to pasture to escape expenses, and over a great deal of this land one can " whip a mouse" at all seasons.

"Farmers and peasantry are being rapidly ruined, and the 'Deserted Village' is no poetic imagination."

* True, and Brae in tea has done well and promised to do better; but Mr. Fraser had absentee partners who wished to realize, we believe.—Ed. *T. A.*

† True again : Haputale coffee is wonderfully free from bug, while it is very prevalent beyond the patanas on Udapussellawa coffee at present.—Ed. *T. A.*

BAD TEA SENT FROM AMERICA TO AUSTRALIA.

A telegram in an Australian paper, dated Melbourne, March 5, runs :—

Two hundred and fifty chests of bad tea per "Tsinan" have been returned from Sydney. The tea was shipped in the United States and was recently condemned in Melbourne. It is understood that the United States Consul will prevent the tea from being landed in the United States.

A German inventor proposes to make boots with stone soles. He mixes with a waterproof glue a suitable quantity of clean quartz sand, which is spread on the thin leather sole employed as a foundation. These quartz soles are said to be flexible and almost indestructible, while they enable the wearer to walk safely over slippery roads.—Ex.—*Indiarubber Journal.*

THE AMSTERDAM CINCHONA AUCTIONS.

AMSTERDAM, Feb. 26th.

The following are the analyses of the cinchona bark offered here today:—The manufacturing bark contained about 9 tons sulphate of quinine, or 3·86 per cent., on the average; about 1½ tons contained 0-1 per cent. sulphate of quinine; 20 tons, 1-2; 42 tons, 2-3; 65 tons, 3-4; 60 tons, 4-5; 19 tons, 5-6; 8½ tons, 6-7; 9 tons, 7-8; 2 tons, 8-9; 2 cwt., 10-11; 1½ ton, 12-13 per cent. Of the total quantity offered 2,385 packages were disposed of at a decline in prices, the unit averaging barely seven cents, or not quite 1⅛d. per lb. The following was the range of prices: Manufacturing barks in quills, broken quills, and chips, 8 to 91 cents (1½d. to 1s. 4½d. per lb.); ditto root, 15 to 50 cents (2¾d. to 9d. per lb.); druggists' bark in quills, broken quills, and chips, 14 to 140 cents (2½d. to 2s 1d. per lb.); ditto root 12 to 13 cents (2¼d. per lb.) The principal buyers were the Auerbach and Brunswick factories.—*Chemist and Druggist.*

COFFEE IN NEW CALEDONIA.

The *Fiji Times*, in advocating the revival of the coffee enterprise in Fiji, notices its success and probable extension in the French convict settlement of New Caledonia. We quote as follows:—

Another matter, which was almost abruptly abandoned before it had received a fair trial on anything like a comprehensive scale, also might well come to the fore. That is—Coffee. Notwithstanding the effects of the disease to which it is subject, there can be no doubt that it can be made a highly profitable production. Fiji need not look far for assurance in this respect. Her near neighbour, New Caledonia, is making a success of it. From a recent number of the *Times*, we learn that "in an official report upon the condition of that colony the Governor states that agriculture, which has hitherto been of only secondary importance, seems to be entering upon a period of rapid development under the influence of the fresh means of action afforded it by the immigration from the New Hebrides, and New Caledonia will produce in this year (1890) 400 tons of coffee, while it is expected that in four years' time the production will exceed 1,000 tons * * * The Governor reports that what New Caledonia is most deficient in is labour, but he adds that the work done by the convicts, especially at the Thio penitentiary, is much more satisfactory than that of the convicts in Guiana, while the men who have served their time and who choose to work can always find employment at wages of from 4s. to 5s. a day, while at piecework they in many cases earn 10s. a day."

It has been proved beyond question that this colony can produce coffee in perfection. Machinery is here, and skilled knowledge. Yet coffee ceases to count among the exports and home consumption has become a thing of the past, simply because the industry has been given up. It is puzzling to arrive at a comprehension of why this should be. Of course there is the ready answer that it "does not pay." But why should that be the case. If New Caledonia can grow at a profit why cannot Fiji do the same. That the French settlement is doing this may be gathered from the expectations entertained of progressive production. An anticipated increase at the rate of 150 tons per annum is by no means despicable; while at the same time it warrants the belief that no oversanguine estimate has been made. It means a lot of money, however, and this colony is not so superabundantly supplied with that evil of life, but that she can cheerfully bear a heavier burden.

So far as labour is concerned, no reason exist why Fiji shall not be reckoned as on a par with New Caledonia. If growers there can afford to pay reasonable wages and find a fair margin of profit, why should not similar conditions prevail here. Soil is at least as fruitful and climate quite as favorable. In fact, it would be hard to state wherein this place is not at least equally well-off with her neighbour in those constituents.*

* So far the Fiji journalist,—but not a word is said as to whether leaf disease has reached New Caledonia. Its absence would make all the difference in the world.—ED. *T. A.*

PORTSWOOD TEAS AND LOCAL SALES

The proprietor of Portswood is not inclined further to support local Tea Sales. His experience is not favourable as may be seen from the following extract which we venture to make from a letter before us, not however, written for the printer:—

"You know that some of us have often been asked to sell our teas locally. I have done it twice or three times and each time with a loss. At a recent sale in Colombo 86 66 and 57 cents were bid for Portswood teas—all were left unsold, being considerably under my values—but since the sale, they have been sold privately by the Brokers at R1, 72 and 62 cents and these prices are 1⁄ to 17 cents under the *average net* price I received in London on 17th Feb. last. Why therefore should I continue to sacrifice the estate interests?"

THE TUTICORIN PEARL FISHERY OF 1890.

Pearl-oysters require rest; and after one fishing a pearl-bank is left in undisputed possession of the young oysters for a certain number of years, to enable them to grow and to settle down on the bed. Following the wisdom which teaches that some years' rest to the beds should be insured after each fishing, the officers and authorities who had the reviewing of the Pearl Fishery Report for the past year have allowed themselves sufficient rest and have proceeded in a leisurely manner to bring into perfection the pearl of a G. O., which now lies on our table. The first report of Captain Baker, the Superintendent of Pearl Fisheries, is dated the 20th of March last year, and his second report the 15th of May the same year. The Acting Collector of Tinnevelly submits his narrative of the Pearl Fishery to the Commissioners of Land Revenue on the 16th June, and the Commissioners submit the same with a review thereon to Government on the 22nd August. The Government deals with the Pearl Fishery on the 19th January of the present year, and the whole proceedings, after enjoying a comfortable rest in the Government office like the oyster on the recently fished up bank, come to us now.

The fishery, as appears from the report, was commenced on the 27th January, 1890, and lasted until the 8th March, when it had to be closed, as the divers went over to Ceylon. It was recommenced on the 23rd April, but it had to be closed again on the 4th May on account of a panic among the divers, two of whom had been bitten by sharks. The number of days during which the fishery was conducted was 40 and the Government's share of the takes amounted to 1,204,816 oysters. The price at which they were sold ranged from R16 to R36 per 1,000. The total amount realized was R24,701-5-10. To this amount has to be added R359-12-0, being the value of loose pearls and the sale-proceeds of the materials of the temporary buildings erected for the fishery. The charges amounted to R17,257-11-5, so that the net profit to Government was only R7,803-4-5. This is a very disappointing result, especially when compared with the net profit of R158,483 which was obtained during the fishery of 1889. The cause of these poor results as explained at length by Captain Baker are chiefly competition by Ceylon, the panic caused by the appearance of sharks, and the extremely low prices. The two last are to be regretted, but could not be avoided, say the Commissioners of Land Revenue. As regards the competition between the Madras and Ceylon fisheries, the Madras Government agrees with the Board of Revenue that effort should be made to come to some amicable arrangement. It is, of course, open to either side to bid for the services of the divers by the offer of better terms, but the Government declares that it would be most averse to entering upon any such system of rivalry, which in the end could not fail to be very disadvantageous to both Governments. This Government has accordingly decided to ask the Government of Ceylon whether it will consent to any arrangement under which the interests of both fisheries will be safeguarded. The questions of clandestine opening of oysters

and of clandestine fishing of the banks were also raised in the papers received by Government. There appear to be three sources of danger to be guarded against—(1) Poaching on the banks by a foreign vessel; (2) Poaching on the banks by a British vessel; and (3) Pilfering of pearls by the boats' crews whilst conveying the shells from the banks to the shore. The first, the Government observes, is a remote danger and may be disregarded. The second may possibly have some foundation of reality. So long as ago 1883 the belief was expressed that the banks were extensively poached but there is nothing on record to show to what extent such poaching was prevalent. Before taking any action in the matter, the Madras Government has resolved to address the Governments of Ceylon and Western Australia in order to obtain full particulars regarding the pearlfishery laws in those colonies. In the latter country it is said that "the fishing takes place in the main outside the 3-mile limit, and the colonial jurisdiction is not supposed to extend so far." With regard to the third difficulty the Bank of Revenue considers that when once the oysters have been raised to the surface and placed on British vessels by persons employed for that purpose by Government, they become the property of Government, and that if the pearls are then abstracted, taken ashore, and sold, the offence is one of simple theft. In this view of the matter the Government is inclined to agree, and in any case by diminishing the value of the produce to be shared between themselves and the Government, the divers are guilty of cheating. The provisions of the Penal Code, the Government considers, are therefore sufficient to meet the case.—*Madras Times*, March 10.

The W. P. A., in its usual go-ahead manner, has offered a prize of R200 for the best essay on tea cultivation, of practical local value. The point on which it requires particular and reliable detailed information is the best manner in which a Factory on the Joint-Stock Principle can be worked. Essays are to be sent to Mr. Hockin of Vayitri, S. Wynaad, before 1st June.—*Madras Times*, March 18.

Wynaad Planting Notes, March 12th.—Last month the rain came down heavily, measuring in some places, as much as two inches, though the fall was very partial, and from what I hear, I fear was insufficient in some parts. The Vythery and Sultan's Battery districts were especially favoured; and the result has been a very fine and healthy blossom which, to all appearance, has set satisfactorily. A great quantity of backward spike is now maturing, and we shall soon be crying out for more rain to bring out our second blossom. So far crop prospects are exceedingly favourable, but so many ills is coffee heir to, that we cannot feel sure of our future, until much later in the season. The heat is very great here now, and the drought is severely affecting the locals; wells are being dug in the paddy flats, and in some of the pardies the people are actually suffering from want of sufficient water to drink. This, of course, is also a bad thing for the new clearings, and a great number of young plants will be destroyed. In spite of the heat and dryness (attributed to the failure of the North-East monsoon), our old coffee is looking remarkably well, and throwing out quite a flush of young leaves. Two of our community, each on his own account, are working hard at experiments for the destruction of leaf disease. Both seem hopeful on the subject, and even should they fail, are deserving of our gratitude for their praiseworthy efforts on our behalf. Wynaad is not particularly lively just now, but the "submerged tenth," of us who *can't* get away even to the hill tops, contrive to meet once a week or so for tennis, and general sociability, and it is certainly pleasant to catch the cheerful drifts of conversation. "Glad to hear you had such a splendid blossom"—"never saw anything like my spike," and so on. It feels like getting one's head above water once again. I hope that my next will be a further record of things, and that I may be able to report that another good rainfall has brought out a second blossom, nearly if not quite equal to the first.—*Madras Times*, March 18.

The Cultivation of Paddy has been shown to be an unremunerative concern. Not only so, but in a congested place like Jaffna where everything depends upon the periodical rains the chances of success are few and far between. Then let our young men launch themselves into other pursuits. Nothing enriches a people or a nation so much as successful commerce. But if trade or commerce is to be successfully pursued, our young men should fully realise the power of association and the value of mutual confidence as the chief conditions of success on any large scale.—*Com.*

Plant Diseases.—Professor Plowright's lectures at the Royal College of Surgeons have been delivered this week. The first was devoted to generalities, and to the effect of fungi in producing over-growth (hypertrophy), from irritation or wasting (atrophy), by depriving the plant of its natural food, and appropriating it to its own use. Various illustrations were given. The second lecture was devoted to the Potato disease. As we shall be in a position to publish these lectures with numerous illustrations, we forbear from further comment at present.—*Gardeners' Chronicle.*

Wynaad Planters' Association.—From proceedings of a general meeting held at Vayitiri Jubilee Hall, 4th March. Present—Messrs. Atzenwiler, Batty, Boosey, W. F. Brown, Chamier, Hockin, Lamb, McCabe, Powell, Ramsay, Rosling, Taylor, Trollope, Walker, Winterbotham and J. F. Jowitt, Acting Hony. Secy. Mr. Hockin in the chair. *Leaf Disease.*—Read letter from the Honorary Secretary to C. E. P. Veruede, Esq. in reply to his offer to come to Wynaad. Also Honorary Secretary's letter to Dr. McCabe thanking him for his Essay. Likewise letter from the Honorary Secretary to the Chief Secretary to Government, Madras, asking the Madras Government to be good enough to forward an application on the Association's behalf to the Government of India for the services of Surgeon Major Barclay on the special duty of further investigating Hemileia Vastatrix. Read also a letter from Mr. Murray together with an extract from the "Detroit Free Press" on the Washington Bureau of Vegetable Pathology. Resolved that Mr. Murray be thanked for the interesting article, and that the Honorary Secretary communicate with Professor Galloway in charge of the Bureau, bringing to his notice the disease our coffee is suffering from, and solicit his aid.

Liquorice.—In *A Modern Apostle: Alexander N. Somerville, D. D.*, by George Smith, C. I. E., LL.D., there is an interesting account of the manufacture of liquorice as witnessed by Dr. Somerville at Sokia, near Smyrna. In his (Dr. Somerville's) own words —"The juice is extracted by machinery, here and in America; for the firm (Messrs. MacAndrew and Forbes) has a factory there, and exports from Asia Minor a large quantity of the root. Only a trifling amount now is employed for medicinal purposes; it is principally used for combining with Tobacco leaf to make 'Cavendish,' which is much in vogue with sailors. The whole valley of the Meander for above 100 miles is more or less overspread with diggers, men and women, extracting the roots from the ground, stacking them, putting them into bags, and sending them on to various stations on camels. I was led to understand that this gives employment to nearly 100,000 persons. Indeed, the business has an important influence throughout the district, by teaching the people habits of industry.......We went over the factory, connected with which are Scotchmen, Circassians, Turks, people from the Isle of Patmos, and Scala Nuova, near Ephesus. The manufacture of liquorice paste is accomplished by grinding down the root between ponderous mill-stones. James, observing in the yard some seventeen of the stones formerly used, and detecting in them a resemblance to the drums of colossal pillars, inquired whether they had not been taken from some antique structure, and elicited the information that the worshippers in the temple of Artemis, at Magnesia, in the days of Themistocles, had not been unfamiliar with them when occupying a very different position."—Athenæum.—*Gardeners' Chronicle.*

CINCHONA CULTIVATION IN JAVA.

Mr. van Romunde's report on the Government cinchona enterprise in Java for the fourth quarter of 1890 states that the weather during the quarter was very abnormal. October and the first half of November being very wet; the second half of November being very dry with low temperature at night and frost in some parts; and December being characterized by alternate rain and drought. The drought in the latter part of November caused considerable damage to the young plants: but the loss can be made good by means of the large number of well-grown plants in the nurseries. The older plantations showed remarkably good growth during the later months; and the prospects for the crop of 1891 are therefore very favourable. The crop of 1890 amounted to 459,000 half kilograms of bark, of which by the end of December 364,123 pounds had been forwarded to Tandjong Priok. Though a considerable decrease in production has been experienced during the past year, this is certainly not to be ascribed to a diminution of the stock of bark in the plantations, but is found in the sparing to the utmost of the trees, specially of the ledgerianas after it was seen that very densely grown plantations were not attacked, at least not appreciably, by *Helopeltis antonii* or by caterpillars, which have caused such devastation of late years. The amount of bark in the plantations has therefore very largely increased during the past year, in spite of the unfavorable weather of 1890. On 2nd October, 6th November, and 11th December, sales of the bark of 1889 were held in Amsterdam, the unit prices obtained being respectively 9, 8 and 8 cents per half kilo. In November and December cinchona seed was sold by public auction, the gross amount realized being *f*1,027 and *f*792. In consequence of the small amount of dry weather in 1889 the supply of ledgeriana seed was very small, and the prices realized therefore far exceeded the minimum prices fixed by the Government. For one lot indeed so much as *f* 2 per gram was paid. The total number of plants in the Government plantations at the end of 1890 was 3,489,800, made up as follows:—In the nurseries 920,000, viz., 510,000 ledgeriana (including 10,000 grafts) and 410,000 succirubra; in the open 2,569,800, viz., 1,905,000 ledgeriana (including 265,000 grafts and cuttings, but exclusive of the more or less 3,000 original ledgerianas), 2,400 calisaya and hasskarliana, 605,000 succirubra and caloptera, 55,900 officinalis, and 1,500 lancifolia (among these about 1,000 *C. pitayensis*).

REVIEW OF CINCHONA BARK AT AMSTERDAM FOR THE YEAR 1890.

(Report by a Dutch Broker.)

Amsterdam, Dec. 1890.

The past year has been one of great importance for the Amsterdam cinchona market, in the struggle for precedence with London as market of the world; our market may be looked upon as the victor.

Much has been contributed to this result by the energetic leadership of the founders of our cinchona establishment, who from the beginning, have taken care that everything could be done to the bark received here, which would tend to promote a favourable sale. The untiring energy with which growers are made acquainted with possible improvements and economy in their productions, has been attended with marked result.

Both buyers and sellers have become convinced that our market offers advantages which are not to be found elsewhere. Each package can be inspected and sampled three weeks before every sale, and of every parcel an analysis is made and published by non-interested analysis. In addition to this the charges to all parties interested have been calculated on a very low scale and are very much less than in London or elsewhere.

From the subjoined tables it will be sufficiently clear how much the trade in this article has increased here. When taking into consideration the average strength of the Java bark and that of the barks offered in London, it will be clearly seen, from a comparison of the turn-over of both markets, in which direction our market is progressing.

At the end of the year our stock in first hand only consisted of about 2,000 packages, being for the greater part arrivals which came too late for the December sales, and partly lots left over from previous sales. This quantity does not comprise the Government barks intended for the public sales in 1891. The stock in second hand is not worth mentioning at least as far as the factory barks are concerned, whilst the stock of pharmaceutical barks is if anything smaller than at the beginning of the year. Notwithstanding the important increase in the arrivals, we yet find here a stock too small to be of any importance, whilst the stock in London is continually decreasing. It appears therefore that so far the demand for quinine has kept pace with the increased productions. Whether this demand owes its origin to an increased consumption (as many think) or whether it is attributable to an increase in the number of speculative buyers, it is difficult to say. So much, however, is certain that in the first case, the low basis which cinchona bark has reached would be perfectly unjustifiable, and the position would have to be attributed to abnormal relations and influences which interfere with the natural course of events.

Factory Barks.—The handling and packing in Java now leaves very little to be desired, and the arrivals this year were again in both respects much better than formerly. Occasionally parcels were met with, which had been insufficiently cleared of wood and fibres which causes distrust amongst the buyers. Bales insufficiently filled are now very much the exception. In Java the importance has been well understood of carefully mixing the barks before putting them in the bales, by which process the bales of every parcel show equal quality. Shippers whose marks have been treated with special care in this respect, will have experienced the advantages of this mode of treatment.

In January the market was very firm and in the first public sale everything was sold at an average unit of about 10 cents, quinine was sold in that month at, from 1s 2½d to 1s 4d per oz. (f. 25½ to 28 per kilo.) This favourable tendency continued until shortly before the March auction, when quinine dropped to 1s 1½d (f. 23¾), and the unit after having reached ± 10¾ ct. in the February sales dropped to ± 9⅝ ct. In the May sales a slow market was experienced with falling tendency and the average price realised was only 9¼c.

In June and July larger transactions took place in quinine at lower prices (12d f 21) and the two sales only realized ± 8¾c. and 8⅝c. respectively per unit. Before the August sales an improvement set in which caused the average unit to rise to ± 9¾c. but in the October sales under the influence of low offers of quinine for forward delivery, the value again fell to a unit of about 9¼c. The November sales the largest of the year were held at a bad time. The financial situation was unfavorable, general distrust and want of activity was experienced, all of which led to a drop and quinine was offered at 11¾d (f. 20½). In this sale not more than 8c. per unit could be made, at which price 703 packages were taken out whilst 409 packages had been withdrawn before the sales. On the same day however the greater part of the barks taken out were sold privately at secret prices.

In December the tendency became if possible still more unfavourable; quinine was even offered at 11¼d, but the low price brought apparently an increased demand. In the last sale of the year everything could be disposed of, at an average unit of 7½ct. and after this

sale the tendency of the article has slightly improved.

PHARMACEUTICAL BARK.—Succirubra was freely offered but it must be observed that there were many parcels amongst them, which were bought by the factories as "fine dust" with a relatively high percentage of sulphate of quinine, and which therefore ought to rank as factory barks.

QUILLS.—Fine, silver-grey, quills well covered with moss fetched continually firm prices and larger shipments of these would undoubtedly be welcome. The highest price was paid for a parcel of officinalis stem bark quills, only 25 centimetres in length, but of a beautiful typical appearance and well grown over being f. 1·15 per ½ kilo. Inferior qualities will no doubt have frequently given disappointment to growers when sold here. When the bark is dark and smooth without moss or silvercoat it does not pay to make it into quill shape; it is more advantageous to grind these barks to dust. In the case of fine but thin bark of good colour, which it is desired to ship as quills it is advisable to pay less attention to obtaining long quills, but to roll them well (not too broad, but straight pieces, well assorted and convenient for packing in cases). The result obtained by a few shippers with produce of only average intrinsic value but which had been prepared with great knowledge and care, has proved the great advantage that can be derived in this way.

BROKEN QUILLS AND BOLD DUST.—Succirubra, in bold thick pieces, coated with moss and little dust always finds ready buyers at relatively high prices. Except from the Government plantations, where very old trees are found, very few parcels of the desired quality appear on the market. Thinner younger bark, if of good colour and free from dust, such as private growers can also furnish also finds buyers however at comparatively good prices. C. Schukkraft, on the contrary remains low in price. H. A. VAN OVERZEE, JR, Broker.

AN ACTION ABOUT CINCHONA BARK.

A PLANTER COMPLAINS OF HIS COLOMBO AGENTS FOR HOLDING HIS BARK CONTRARY TO INSTRUCTIONS.

Baker and Hall v. *E. P. Wilmot.*

(D. C. Colombo No. 1,027.)

This was an appeal from the judgment of Mr. J. Grenier, Acting District Judge of Colombo.

Mr. Wendt (Mr. Dornhorst with him) appeared in support of the defendant's appeal.

The Attorney-General (Mr. Browne with him) for the plaintiffs, respondents.

Mr. Dornhorst replied, and the Court took time to consider its judgment.

On 4th March 1891 the following judgments were delivered :—

DIAS, J.—The defendant in this case is an estate owner, and the plaintiffs are Colombo merchants. It was agreed between the parties that the defendant should forward to the plaintiffs at Colombo his cinchona bark, and that the plaintiffs should cure, prepare and ship it to their agents in London for sale; that the plaintiffs should draw on their agents against the bark, and the proceeds of the drafts should be paid over to the defendant, and if the bark when sold in London should fail to realise sufficient to cover the drafts, then the defendant should make good to the plaintiffs the deficiency, with the usual mercantile charges. Accordingly, from 26th Dec. 1887 to 10th April 1888 cinchona bark was sent by defendant to the plaintiffs who shipped it to London, for sale, which resulted in a net deficiency of R5,240·93, of which the defendant paid plaintiffs R1,500, leaving a balance of R3,740·93 in favour of the plaintiffs, and this action is brought to recover that amount with interest. The contract as it is set out in the libel is not denied, but the defendant adds another condition to it, which is that the plaintiffs should not sell the bark for any price less than 3d per unit of sulphate of quinine in each bark, the unit being one per cent of the weight of the bark. The defendant says that till Nov. 1888 the plaintiffs held in London 23,765 lb of the defendant's bark, and that in December 1887 and Jan. 1888 the market price for such bark was 3d per unit, when it was the plaintiffs' duty to sell, but they did not and sold in Oct. 1888, when the market price had fallen to 2d per unit—that if the bark had been sold in Dec. 1887 and Jan. 1888 it would have fetched £508 13s 3d, the plaintiff's claim would be less by R2,788·48, and the difference in favour of the plaintiffs would then be R748·02, which the defendant brings into court. There is also a claim in reconvention by the defendant, which in the view I take of the case need not be noticed. In the replication the plaintiffs denied the new contract set up by defendant, and they also denied that in Dec. 1887 and Jan. 1888 bark like the defendant's was worth 3d per unit.

Two questions arise for consideration, viz. (1) whether the plaintiffs were expressly prohibited by defendant from selling below the 3d., and (2) whether the market price of cinchona like the defendant's in Dec. 1887 and Jan. 1888 was 3d per unit. The correspondence between the parties has been summarised by the District Judge, and the result arrived at by him is that the defendant gave the plaintiffs a discretion as to the price, and this finding I think is fully borne out by the letters. On the second question the evidence is all on one side. It appears that by a mere accident the price of cinchona in the London market on the 6th December 1887 had reached the figure 3d, but when we come to consider the circumstances under which public sales of cinchona bark are held in London, the plaintiffs cannot be expected to forsee that on a particular day in the month of December Cinchona bark would realise 3d per unit. In a carefully considered judgment the District Judge gave plaintiffs judgment, and I am not prepared to interfere with it. Affirmed.

CLARENCE, J.—I think that the Judgment of the Court below is right. The evidence does not sustain defendant's averment that there was an agreement not to sell for less than 3d per unit. The letter of defendant, to which plaintiffs' letter of October 4th 1887 was the reply, is not before us, and all that appears is that defendant wished to get not less than 3d per unit, and plaintiffs then assented to let their London Agent hold the bark for the present, in hopes of the market reaching that price. The market afterwards about December 1887 momentarily touched 3d and then drooped. Plaintiffs, with defendant's approval, held on till October 1888, and then in despair of any improvement in the market sold for about 2nd. Nor do I think that the evidence discloses any breach of duty on plaintiff's part in selling under 3d. It is, I consider, sufficiently shewn that the rise in December 1887 was a sudden and unexpected rise of merely momentary duration and that, having regard to the time required for preparing lots for sale, no negligence can be imputed to plaintiffs in not having seized this momentary rise. Nor, indeed, am I satisfied that defendant's bark, if thrown on the market at that moment, would have commanded the full 3d rate. I agree that this appeal fails and should be dismissed with costs.—Local "Examiner."

SALE OF ESTATES.—The sale and purchase of estates in Ceylon goes on merrily, and hardly a week passes but we have to record properties changing hands, sometimes in the island, though often the purchasers are home capitalists the safety of Ceylon estates as a profitable investment having apparently at last become evident to investors at home. We hear for instance that a Syndicate at home is now in treaty for the purchase of the properties of Mr. F. M. Corbet which led to the now famous litigation with the Ceylon Company, while a telegram was received yesterday by Messrs. E. G. Harding & Co., to the effect that the estates in Rakwana of Mr. C. Shand—Barra, Rangwelteune, and Springwood—have been sold to a Syndicate, the names of whom were not mentioned, while the price is also unknown, but Messrs. E. G. Harding & Co., who have been appointed by wire to look after the interests of the purchasers, will know soon by mail.—Local "Times."

MEMORANDUM ON THE PRODUCTION AND DISTRIBUTION OF SILVER.

As it is now practically certain that no fresh Silver Legislation will be enacted by the present Congress, and as the new House of Representatives is not likely to be called together (unless for special business) till the 4th December next, our friends who are interested in Indian Exchange may like to see the following estimate of the Statistical Position of Silver:—

The following therefore is our Estimate for the current year's Distribution, assuming as in Table 1 that the total production is taken at 145,000,000 ounces viz:—

Table III. Ounces.

PRODUCTION OF SILVER (in ounces.)

Table I		United States		Rest of the World	Total
1887	...	41,260,000	...	54,917,375	96,177,375
1888	...	45,780,000	...	64,292,140	110,072,140
1889	...	50,000,000	...	75,988,671	125,988,671
Estimates 1890	...	53,000,000	...	83,000,000	136,000,000
Estimates 1891	...	57,000,000	...	88,000,000	145,000,000

The estimates for 1890 and 1891 are, of course, to some extent guesswork, but it will be seen that the ratio of increase has been put very considerably below that of the preceding years, though the stimulus to production afforded by the higher prices recently current would seem to justify very much larger estimates. For instance a Dalziel telegram from New York to *The Times* yesterday estimates the United States production for 1891 at 65 million ounces, against our estimate above of only 57 millions.

DISPOSITION OF SILVER.

The following figures are (approximately) summarized from the Report of the United States Treasury to Congress in December 1889, and refer to the previous year (1888).

Table II.		Ounces
United States Coinage and Certificates	...	26,000,000
Arts and Manufactures (for all the World, Soetbeer's Estimate)	... ...	16,000,000
Subsidiary Coinage, Europe and S. America		17,000,000
Sundries (unaccounted for)	... ...	6,000,000
China, India, and the East	... ...	45,000,000
Total for 1888 (as per Table I)	...	110,000,000

PRESENT POSITION.

No more recent figures than the above as to the Distribution of Silver are obtainable, but we think it may be fairly assumed that the Consumption for Arts, Manufactures, Subsidiary Coinage and Sundries (unaccounted for) will be no more now than it was in 1888, looking to the rise in price. The purchases by the United States Treasury have however increased from 26 million to 54 million ounces, in consequence of last year's legislation.

United States Treasury Purchases...	54,000,000
Arts, Manufactures, Subsidiary Coinage and Sundries (unaccounted for) as in 1888...	39,000,000
Leaving for consumption by India and the East	52,000,000
	145,000,000

From the above it would seem that India and the East will have to absorb (even on the extremely moderate Estimate of production given in Table I) 52,000,000 ounces in 1891 against 45,000,000 in 1888, although Silver and the Eastern Exchanges are now higher than they were then. Moreover there is now a large accumulated Stock of Silver in the United States estimated at about 15 million ounces, which must also be disposed of. These considerations seem to indicate that Silver and Exchange must come down considerably in order to admit of the additional absorption.

On the other hand it must be borne in mind that the new House of Representatives which meets in December next is very differently constituted to the present one; they are largely pledged in favour of Silver Legislation, and the expectation that they will pass some strong enactment in favour of Silver is likely to sustain the price of it speculatively.

The following figures show the shipment of Gold and Silver from Europe to India and the amount of Council Bills for the last 5 years:—

Table IV.		GOLD	SILVER	COUNCIL BILLS.* £	COUNCIL BILLS.* R.
1886	...	819,201	7,044,477	10,292,692	13,53,25,369
1887	...	1,984,739	6,577,748	12,136,279	16,70,03,150
1888	...	1,308,232	5,854,533	15,358,557	21,81,23,993
1889	...	2,103,381	8,189,210	14,262,859	20,89,91,221
1890	...	3,283,375	8,825,771	15,474,496	22,41,86,638
		£9,498,931	£35,924,739	£67,524,903	R95,36,30,371

* For the Financial Year, viz.:—1st April—31st March.

The steadily increasing shipments of Gold to India constitute a noteworthy feature, as tending to decrease her balance of trade and consequent ability to absorb Silver.

ARBUTHNOT, LATHAM & Co.

33, Great St. Helen's, London, 26th Feb. 1891.

PINEAPPLE FIBRE IN THE PHILIPPINES.

Mr. F. W. van Eeden, director of the Colonial Museum sends us the following for publication. Mr. P. K. A. Meerkamp van Embden, our Consul at Manilla who sent us some fine samples of Pineapple fibre last year, which was prepared at Serson, now furnishes us with an account of its preparation. The Ananas which was introduced here from Mexico about 300 years ago, is named in Spanish "Piña" (pronounced "Pienya") and has no other name in the native languages or dialects of the Philippines.

The plant bears fruit generally in the second year, sometimes in the third year, shortly before this takes place, the leaves which, by that time have attained their full growth, frequently a metre in length are cut, and their preparation begins immediately. Should the fruits be once formed, the quantity of the leaves deteriorates.

The preparation is simple to the last degree, the leaves are worked one by one, being laid on a smooth wooden plank, and scraped with a little earthen pan or dish until the fibre on one side of the leaf becomes exposed and can be carefully drawn out. The leaf is then turned over, in order that the fibre may be detached in the same way from the opposite side.

For removing the pulpy matter from the leaves a piece of coarse china puttery is commonly used, as good well made pottery would be too smooth. The fibre from the under side of the leaf is of finer quality and therefore of more value than that from the upper side. There now remains nothing more to be done than to wash the fibre and to bleach it in the sun until it becomes sufficiently white, though the color always has a yellow tinge.

Before being woven the ends of the threads are tied together, the knot is so carefully made, that it requires very close examination to discover it. Occasionally the ends of the fibres are united by means of starch, but this practice cannot be recommended, and is but little used because the fibres thus joined are liable to loosen.—Translated from the *Indische Mercuur* of the 21st February 1891, by J. D. Y.

[NOTE BY TRANSLATOR.—It is from this fibre that the beautifully fine "grasscloth" is made. The Ananas grows so well in Ceylon and most tropical countries that is seems strange that the Philippines seem to retain a natural monopoly of the very fine "grass-cloth." It used to be brought to Ceylon but I have not seen it for many years. It is a pity the Consul Meerkamp van Embden has not given any particulars as to the kind of Ananas which furnishes the fine fibre. Can you tell your readers whether it grows in Ceylon or not, every variety that has been introduced into this island seems o flourish wonderfully well?]

CEYLON TEA IN AMERICA.

We venture to take the following extract from a letter of Mr. R. E. Pineo, under date, New York, 23rd February:—

"Although I have not rushed into print I yet feel very keenly how misunderstood and how little appreciated in Ceylon my efforts here have been. It has not been easy work to get Mr. May to help us in our great cause, but I feel encouraged by what he is doing and am delighted that you appreciate and understand him through his manly, straightforward, honest letters that cannot but convince you how strong and conservative he is. We are making slow, but I think sure, progress; and, in time, I hope our work will be better known and appreciated by our friends in Ceylon.

"Our work is being honestly performed, and through us pure Ceylon tea is becoming known. We are getting agents, but as we are very particular about securing the right men our progress may be thought slow."

Mr. Elwood May's last letter to Ceylon, we may tell Mr. Pineo, certainly did not create a favourable impression as regards manliness!

THE CINNAMON TRADE.

The news we published on March 17th of the quarterly Cinnamon Sales held in London last month, was not very cheering to Proprietors. The supplementary information contained in our commercial columns yesterday, was not calculated to lighten anxiety. It will be seen from the prices realised, that some of the finest Marks, which always commanded top prices, fetched about the lowest prices. The explanation is, not that there has been any falling off in the quality of the spice turned out by the crack Estates, but that the higher qualities had to be bought in. Looking at the Sale Lists received on Tuesday, we find that of more than half the catalogue which failed to find buyers, the better part was fine Cinnamon. Thus, the only quality of the A. S. G. P. (Golua Pokuna) Mark which was sold, was No. 4. Of Firsts 28 Bales, of Seconds 41 Bales, of Thirds 46 Bales, and some even of Fourths had to be bought in. So with the higher grades of F. S. W. S. (Wester Seaton) and F. S. K. (Kimboolpitiya)—they found no buyers. Some part of these Marks was, we believe, sold subsequently at a decline of 2d. a lb. These Marks had long commanded 1s. 7d. to 1s. 8d. for their highest qualities—prices low enough, when far coarser Quills of the same classification fetched about double those prices, so late as 15 to 20 years ago. The highest price last month was fetched by the J. D. S. R. Mark; and that was obtained after the sale. The conclusion seems inevitable, from a study of the results of the last and the preceding sale (at which, too, a large quantity of the best Cinnamon had to be bought in) that buyers have decided on a maximum of 1s. 2d. to 1s. 3d. a lb. Unless, therefore, the manufacturers of fancy quills are prepared to reduce their prices by almost one-third, they must hold their stocks. The more important question, however, has reference to the future—Will Estates continue to manufacture Cinnamon of a quality for which there is no demand commensurate with the cost of preparation? There should be only one answer to the question.

When dealing, about a fortnight ago, with the note of warning sounded by a Voyangoda correspondent against fine cutting, as injurious to the productiveness or Estates, the thought occurred to us, that the need of manufacturing quills of extraodiuary thinness might cease by a falling off in the demand for them. We had not forgotten that at the November Sales the finest spice had been neglected; but, in view of the strong demand that there had been a few quarters before for fine qualities—medium and coarse sorts having shown a decline!—we hesitated to discuss a contingency which did not seem imminent. But the news brought Tonuesday points to the probability that buyers have noted the continued overproduction of the spice, and have also, perhaps, discovered that bark of coarser make might serve their purpose almost as well as fine quills. Whether this feeling is temporary, or is likely to be established permanently, it is impossible to say with certainty; but experience with the downward tendency of prices for a long time past, and the ready market found for Chips, justifies the fear that growers must be prepared for a further fall. In these circumstances, it would be absurd to continue the manufacture of over-fine Quills, to the detriment of Estates. We have no faith, however, in combination; and fine manufactures, we fear, will continue to depress the prices for medium makes on one side, just as Chips have done from another. It is not easy to see a remedy, to avoid, on the one hand, the Scylla of deterioration of Estates, and on the other tho Charybdis of over-production. One point seems clear, that extra-payment for extra fine quills should cease. If an arrangement be practicable, limiting 30 quills to the lb., the fall in price may be made good by an increased outturn, and by the revival of Estates.—Local "Examiner."

POLISHING WOOD.

The method of polishing wood with charcoal, now much used by French cabinet makers, is thus described in a Paris technical journal:—All the world now knows of those articles of furniture of a beautiful dead black colour, with sharp, clear-cut edges and a smooth surface, the wood of which seems to have the density of ebony. Viewing them side by side with furniture rendered black by paint and varnish, the difference is sensible that the considerable margin of price separating the two kinds explains itself. The operations are much longer and more minute in this mode of charcoal polishing, which respects every detail in carving, while paint and varnish will clog up the holes and widen the ridges. In the first process they employ only carefully selected woods of a close and compact grain, then cover them with a coat of camphor dissolved in water, and almost immediately afterwards with another coat, composed chiefly of sulphate of iron and nutgall. The two compositions, in blending, penetrate the wood and give it an indelible tinge, and at the same time render it impervious to the attacks of insects. When these two coats are dry, they rub the surface of the wood first with a very hard brush of conch grass (*chien dent*), and then with charcoal of substances as light and friable as possible, because if a single hard grain remained in the charcoal this alone would scratch the surface, which they wish, on the contrary, to render perfectly smooth. The flat parts are rubbed with natural stick charcoal; the indented portions and crevices with charcoal powder. Alternately with the charcoal the workman also rubs his piece of furniture with flannel soaked in linseed oil and the essence of turpentine. These pouncings repeated several times cause the charcoal powder and the oil to penetrate into the wood; giving the article of furniture a beautiful colour, also a perfect polish which has none of the flaws of ordinary varnish.—*Ceylon Advertiser.*

ANOTHER PAPER MILL FOR BENGAL.—A Calcutta paper says that a paper manufactory under the auspices of several respectable zemindars of Behar is to be started at Patna under competent European supervision, and with this view arrangements have just been completed in Calcutta to import the necessary plants and machinery from England. The services of a competent foreman are also to be imported from home, and a certain wellknown paper manufacturer of England has been addressed on the subject. It is anticipated that the venture will succeed, as Behar possesses an abundance of tho raw materials suited to the manufacture of paper.—*Pioneer*, March 8th.

PRESERVING HEMP ROPES.—In order to insure greater strength in ropes used for scaffolding purposes, particularly in localities where the atmosphere is destructive of hemp fibre, such ropes should be dipped, when dry, into a bath containing 20 grains of sulphate of copper per litre of water, and kept in this solution some four days, afterward being dried; the ropes will thus have absorbed a certain quantity of sulphate of copper, which will preserve them for some time both from the attacks of animal parasites and from rot. The copper salt may be fixed in the fibres by a coating of tar or by soapy water and in order to do this the rope is passed through a bath of boiled tar, hot, drawing it through a timble to press back the excess of tar, and suspending it afterward on a staging to dry and harden. In a second method the rope is soaked in a solution of 100 grams of soap per litre of water.—*Indian Engineer.*

DARJEELING.—We have had a tolerably good fall of rain here, which has been pretty generally distributed throughout the district, and which it hardly needs to be said has done a very great deal of good in every way, more especially to crops of all kinds. This rain was, of course, exactly what all tea-planters were needing after such a long-continued drought as we have had; and I notice that everything has been freshened up by it. Snow fell at the same time all along the crests of the Singalela Range as low down as Tongloo, and, indeed, as I write, the snow has not even yet been entirely melted on the crest of Phalut. I notice that large consignments of "shooks" for tea boxes are arriving by the D.-H. Railway. Most, if not all, tea estates in the district are now-a-days obliged to import their box planking just as they have all along been obliged to import tea lead, solder and other stores required for manufacture, as the restrictions of the Forest Department are so great that it is cheaper to import box-wood than to obtain it locally. It is here that the metal boxes must tell in the long run, and judging from the brokers' reports these metal boxes have answered the purpose very well wherever they have been used.—*Indian Planters' Gazette*, March 4th.

THE DANGERS OF SUGAR CULTIVATION AND MANUFACTURE IN CUBA.—There being no sugar cultivation of much consequence in Ceylon, (the enterprise having proved a failure), we do not often quote *articles* referring to the sweet cane. But there is much of interest and value in exchanges which reach us. For instance, in the *Louisiana Planter*, just to hand, there is a letter from Havana, disclosing the special risks of the pursuit from fire in the field and steam in the factory. We quote as follows:—

We have, this week, to report a long series of sad events, consisting in several large cane fires, which seem to have commenced this year earlier than customary, and two terrible boiler explosions, which, besides inflicting heavy losses to the owners of the plantations on which they occurred, have also caused the death of several men and wounded a larger number. The plantations on which fires took place are: La Rosita, Alfonso XII, 160,000 arrobes; La Gabriel, at Nueva Paz, 150,000 arrobes; San Juan, at Roque, 100,000 arrobes; Mercedes, at Palmillos, 50,000 arrobes; colonies, Sangre de Dios, at Nueva Paz, 40,000, and San Ramon, at Jaguoy Grande, 50,000 forming a total of 550,000 arrobes, equivalent to about 7,375 tons of cane that was burned, the greater part of which may as yet be converted into sugar, provided that it does not rain before it can be ground. By a strange coincidence, both estates on which a boiler exploded are called Merceditas, on the first one, situated at Melena del Sur, part of the sugar house and machinery department were torn to pieces and the death of six men and severe wounds to a great number were to be deplored, whilst on the second, situated at Bainoa, the damage was limited to the unroofing and part of the walls of the engine house tumbled over. With the exception of the fire on estate Mercedes, which was intentionally set, all the others seem to have taken place through carelessness.

THE SEA ISLAND COTTON of Tahiti is a beautiful silky fibre, but difficult to manipulate. We learn, however, that M. Raoul, a French colonist of Tahiti, has succeeded in growing a hybrid variety, obtained by crossing the sea island cotton plant with the wild cotton shrub of Guadaloupe. The journals of Tahiti give a glowing account of the fibre and the richness of the yield.—*Globe.*

BELLEVUE AND SINNEGODDE COCONUT ESTATES.—The information we published, that Mr. Charles Byrde is the purchaser of these estates, was derived from a source that should have been well informed, but it is probable that the purchase was on behalf of Mr. F. W. Byrde who had recently disposed of a Kelani Valley property of his. A correspondent writes: "It will be instructive to know that there was keen competition for those estates. The offers were as under—

R15,000 by J. P. de Vos.
R17,000 by H. J. C. Pereira.

R20,000 by F. W. Byrde per Messrs. Rogers & Co. R20,000 being the highest offer made, the sale was concluded in favour of Mr. Byrde—at the rate of almost R100 per acre."

PATENTS IN HOLLAND.—A good many years ago says the *Journal of Useful Inventions*, the Minister from Holland, at London, was consulted in respect to some proposed reforms in the patent system there. He replied there were no patent laws in Holland, and none were required, the arts in that country had passed beyond the period of discovery, and hence the improvements made by indviduals could not fairly become personal property. This is the substance but not the words of the story, and it contains a tolerably large suggestion, supposing the Dutch Minister to have been sincere in his views. A much better explanation, however, would be to say that the Dutch have so nearly abandoned the arts that a patent law there would amount to little more than a tax in the interest of foreign inventors. Looking at Holland of our day, it is hard to imagine that 300 years ago it was a kind of centre in Europe of skilled industry, inculding millwrighting, and so on. The want of fuel, water power, iron, and timber, has nearly put an end to such industry there, and to patents too.—*Electricial Trades Journal.*

THE GARTMORE FANCY TEA.—"The sale of a pound of Ceylon tea in Mincing Lane for £10-12-6 beats even the highest of the recent high records. The Gartmore Estate has achieved the costly honour of obtaining for a small lot of tea this extravagant price. A plantation which should be so reckless as to send to Mincing Lane fifty boxes of tea of equal value would not long escape bankruptcy. The method employed to achieve the result is even more wasteful than the process which the famous Soyer recommended for producing a juicy mutton chop—to skewer three chops together side by side and burn the two outer ones to cinders so as to obtain in the middle chop some share of the juice and flavour of its calcined mates. In plucking tea the practice is to pick the three top leaves of every tender branchlet; on plantations where quantity is in more demand than quality the topmost five are taken. The smallest, the most delicate in flavour of the three, or the five as the case may be, is the topmost, which is also the youngest and the least in size. By picking out this the rest lose that flavour which is necessary to impart the bouquet to the whole and sink into the lowest and almost unsaleable class of teas. The tiny leaf is so light and fills so small a space that a great number is required to make up even a pound or two. Nothing so wasteful of the gifts of nature has been devised by the wit of man since Roman epicures made ragouts of the tongues of nightingales, or drowned valuable slaves in fish ponds in order to procure lamprey of the finest flavour.—*Bombay Gazette.*

NITRATE OF SODA.

The transition from nitrogen-absorbing plants about which I wrote recently, is natural to nitrogen in its concentrated form as derived from the nitrates or saltpetre of Chile, the supplies of which may be rendered uncertain by the

WRETCHED CIVIL WAR

which has arrested the previously satisfactory progress of this leading South American Republic, although Peru and Bolivia also export nitrate of soda. There is an interesting article on the chief article of Chilian commerce,—the mainstay of its revenue, in truth,—in the latest number of the "Agricultural Gazette of New South Wales." Mr. Anderson, the Director of Agriculture of the above colony, believes that this valuable fertilizer has been formed by the decomposition of sea-weed and other organic matter :—

The nitrogen of which has become nitric acid by the process of nitrification, which acid has eventually formed nitrate of soda or Chili saltpetre. In its crude state it contains from 27 to 65 per cent. of the nitrate mixed with common salt, sulphate of soda, gypsum, and other impurities. After purification the commercial article is supposed to contain 95 per cent. pure nitrate of soda, or—in the language of analysis—it has a refraction not exceeding 5 per cent.

The exports from Chile rose from 729 tons in 1878 to 1,000,000 of tons in 1889, mainly from the discovery that the nitrate added so largely to the saccharine matter in beetroots. The results were the

ENORMOUS INCREASE OF EXPORTS

I have mentioned and the sinking of the prices of nitrate from £16 to £9 per ton and of beet sugar from 15s to 11s per cwt. To quote again :—

The manurial value of nitrate of soda is due to the 15·75 per cent. of nitrogen which this salt contains. It is extremely soluble, and therefore be used only on growing crops which can utilise it, and not allow it to be washed out of the soil into the drains.

Reckoning sulphate of ammonia, which contains 20 per cent. of nitrogen, at its Sydney price of £13 a ton, nitrate of soda is worth £10 5s a ton, and is therefore well worth experimenting with at anything under that price.

There is considerable rivalry between this salt and sulphate of ammonia as the two chief sources of nitrogen amongst artificial manures, but it is now generally admitted that on dry soils and on light loamy soils the former is to be preferred, on heavy clay land and wet soils, the latter. The nitrate has been proved to be of great value to all straw growing plants, especially wheat and barley, peas, vetches, lupines, clover, buck wheat, rape, sugar-beet, potatoes, celery, onions and linseed; with maize and tobacco the ammonia salt does better. Dr. Voelcker has shown at Woburn that 1¼ cwt. of nitrate of soda gave £4 8s 6d worth of wheat and 12s 6d worth of straw. With barley and potatoes also the results are very satisfactory.

Many farmers argue that nitrate of soda exhausts the soil, and therefore leaves it in a poor state for the succeeding crop. It will be at once seen that the larger it makes the crop the greater is the quality of mineral matter it must take out of the soil; but which is more valuable—the increased yield of grain and straw, or the few pounds of potash and phosphoric acid?

For example, 1 cwt. of nitrate of soda may increase a crop of oats by 3 cwt. of grain and 5 cwt. of straw, which will remove from the soil about 4 lb. of phosphoric acid and 11 lb. of potash; but the increase in the crop is worth about 25s., while the mineral matter can be replaced by 20 lb. of superphosphate and 1 cwt. of kainit for 4s 6d.

This points to the expediency of using nitrate of soda with some form of phosphoric acid, such as bone-dust or superphosphate of lime (which must be dry when mixed with the nitrate, or decomposition may ensue), and some source potash of such as the sulphate or kainit.

It is very valuable in enabling crops to resist the attacks of small parasites such as the beet-fly, turnip-fly, and fungi, owing, probably, to the rapid development of chlorophyll in the leaves by which the plants are placed beyond the destructive influence of those parasitic pests.

We cannot help thinking of the probable

GOOD EFFECT ON RICE

of an application of nitrate as we read :—

On a good mineral soil, 1½ cwt. of nitrate of soda has been found to increase the yield of wheat from 27 bushels and 1 ton of straw, to 44 bushels of grain and 1½ tons of straw,

For vegetable gardens and fruit orchards applications of this substance seem specially valuable :—

For the market gardener who wishes to raise immense crops of early vegetables, this manure has proved a great boon. Instead of applying 75 to 100 tons of stable manure per acre, and working the same in with great toil, he now applies 250 lb. of nitrate of soda and 500 lb. of superphosphate in early spring before drilling in the seed, and again 250lb of nitrate when the plants are a few inches high, and yet another similar dressing in three or four weeks. The results in promoting great growth and early maturity are surprising. Why? First, because this amount of nitrate of soda really contains more nitrogen than 25 tons of average stable manure would supply, and it contains the nitrogen in a form—nitric acid—*at once* available, whereas the nitrogen of the dung has to be changed into nitric acid for the use of the plant by the presence of lime or carbonate of lime or potash in the soil, and the slow process of nitrification—a process that depends on minute living organisms (bacteria) producing a ferment in the soil, and must have a proper proportion of moisture with a temperature ranging from 54° F. to 98° F. It can hence be readily understood how nitrate of soda acts so wonderfully in a drying cold spring, where dung or sulphate of ammonia may refuse to act. Hence also may be deduced the wisdom of applying dung in the autumn and the nitrate as a valuable supplement in the early spring. For early cabbages, cauliflowers, onions and celery, its value has been proved. With regard to fruit, it is of great service in promoting the formation of sugar and early maturity. A dose of ½lb will often recover a sickly lemon or mandarin tree.

The article from which I have been quoting is followed by one on the cultivation of *Coffea arabica* in certain parts of New South Wales, where it grows well and is singularly free from disease. No doubt tea and coffee, like sugar, could be grown in many parts of Australia, but the

HIGH WAGES OF LABOUR

place an insuperable bar to profitable cultivation of such plants in competition with places where comparatively low priced labour is plentiful.

"TIMEHRI."—The December 1890 number of this journal of the Royal Agricultural and Commercial Society of British Guiana has the following contents:—Papers.—The Post Office in British Guiana before 1860, by James Rodway, F.L.S.; Fireflies, by Lady Blake, Jamaica; Statute Law Revision, by Dr. J. W. Carrington, C.M.G., Q.C.; The Necessity of Pure Air for Health, by E. D. Rowland, M.B., C.M., Edin.; Notes on the Geological Reports of British Guiana, by the Editor; On Parasites, by A. T. Ozzard, M.R.C.S., England; Contracts with Cane Cutters, by A. R. Gilzean; Notes on Scale and other Parasitical Insects, by R. Ward; On the Upper Berbice River, by the Editor; The Barbados Sugar Cane Experiments, by J. B. Harrison, M.A., F.G.S., F.C.S., &c. Occasional Notes.—Gold and Diamonds in British Guiana; Rice growing in British Guiana; Dried ripe Bananas; Scale Insects; Young Aboma. Reports of Society's Meetings, from July to December, 1890. List of Popular Science Lectures.

THE NEW TEA DRIERS:—THE MAN AND THE MACHINE.

The production of tea in Ceylon has now attained such dimensions that every improvement in the machinery or its manufacture must be of high importance to planters. The two or three inventors who are coining fortunes out of their patents can have by no means exhausted the possibilities of invention, and this truth they prove themselves by continually making so-called "improvements" to what were declared to be "perfect" machines only the year before. But this is a dodge common to most patentees, as profitable to themselves as its object is transparent and irritating, if—being satisfied with the original type,—you are unable to get its worn-out parts renewed because they have been "improved" out of existence. It is high time, therefore, that we had some more permanently perfect machine, more up to the work it is declared able to perform than as 50 is to 200. Concerning this fact I will tell a good story later on. Not having been able to be present at the public trial of Sharpe's new Drier, at Hangran Oya, and I was invited to a private view a day or two ago, and I then made the acquaintance of the inventor and his machine at the same time, and I now propose to give you some account of both in a free and easy manner. Owing to the inevitable "accidents" that always happen, that public trial was almost a failure. With the impetuosity characteristic of youth, these big men—Messrs. Philips and Sharpe (6 feet 4, and 4 feet 6 respectively)—hurried on the "trial day,"—a month too soon—with the inevitable result—partial failure. The machine itself is no failure, but its public exhibition was, and that without anybody being to blame, because Mr. Sharpe "wanted to get away," and the jobbing engineers failed to produce an essential part "till the very last moment," thus rendering anything like preparation impossible. The consequence was that the "report" sent to the *Observer* was the poorest stuff that ever flowed from the facile pen of that ready writer, while the other fellow who reported for the "Independent" got fits for his pains from the outraged inventor. I predict that those who avail themselves of a private view a month hence will form a more favourable opinion, and be forced to admit that a new Drier of great durability and capability has come quietly into the country, and has come to stay.

Personally, Mr. Sharpe is a genuine and interesting specimen of the British Working Engineer, to whom an intricate piece of machinery is as familiar and dear as his playthings are to a schoolboy. It is a gain to Ceylon to have such men amongst us occasionally, and unless Mr. Sharpe's interests are very extensive elsewhere, he would do well to settle in Ceylon, where there is plenty of room for competition in his line by really competent men. Anyone troubled with obstinate machinery refusing to do its fair amount of work would do well to invite Mr. Sharpe to take a look round his factory. Here 's a case in point:—Mr. Sharpe paid a visit to one of our largest factories, chokefull of all sorts of rollers, driers, packers, sorters, turbines, engines and the rest, with miles of belting whirling in every direction as might be expected in a factory where they turn out 5,000 lb. made tea a day, more or less. The manager, whom we will call Mr. Ponsonby, gave Mr. S. *carte blanche* to check the work done by any machine he liked. He fixed on the latest brand new "Horizontal Blower"—"Tea seed in at one end, and 300 lb. an hour of sorted tea packed in fancy canisters out at the other end," sort of Drier. Instead of 300 lb. he found it doing 50 lb. an hour (!) and almost bursting its boiler at that. Mr. P. thought there must be some mistake, but testing it again along with Mr. S. no more could be got out of it. "Fancy that," said Mr. P., "what 's to be done?" "Ah," said Mr. Sharpe, "What indeed? All the world knows by this time, that you can make good tea, but you can't be expected to know everything about machinery. I see there the fault lies plain enough." "Do you? What is it?" [" Well," said Sharpe, scratching his head, "I am at heavy expenses coming to Ceylon. Everybody has got his own business, and that 's mine. Any other machine I can test for you?" "Oh, bother any other machine," said Mr. P., "tell me what 's the matter with the 'Horizontal Blower,' and name your own fee." "Well, thank you, sir, R100 please."] "Call some coolies and masons"; and without touching the machine itself, Mr. Sharpe doubled its output on the spot. Before going further let me confess that the words enclosed within brackets are my own wicked invention all the rest being true. In point of fact, Mr. Sharpe most liberally did the job for nothing without a hint at a fee.

Perhaps *this* hint to the wealthy proprietors of that estate will not be thrown away—if Mr. Sharpe himself will forgive me for saying so—on the principle that the labourer is worthy of his hire. Such is Mr. Sharpe.

As for the Drier itself, he is still working at it, exercising such patience as the absence of his big shops and appliances at Lincoln render necessary.

Externally, apart from the inevitable furnace, it is a steel cylinder standing on the floor level 7 ft. or 8 ft. high, by 6½ ft. in diameter. Within revolve horizontally four trays, their centres being fixed to and turned by a vertical shaft, their circumferences being supported on a narrow fixed rail, on which they travel. Each of these rails has a "cut-out" part, at the proper place, which drops and raises sections of the trays, rapidly, one after the other, till in the course of one revolution each tray has discharged its contents on to the one below it, the tea being automatically delivered outside, from the bottom tray. At the trial only three trays were in operation, I am told, doing 60 lb. an hour. The construction of a fourth tray is that which is engaging Mr. Sharpe's attention now. All future machines of this size (the smallest size made) will have four trays, and the output be guaranteed at nearer 100 lb. an hour than a maund. So says Mr. Sharpe. The trays are not wire gauze, but thick sheets of galvanized perforated iron. Instead of its vital parts wanting renewing every year, I think it likely that, once put up, a machine will see the estate itself change hands before its own parts call for change.

R. W. J.

DR. GOEBEL, a well-known botanic scientist, has gone out to Demerara for the purpose of making a careful study of that curious pink flower, or rather lily, which is peculiar to the watercourses in that region. The plant, it will be remembered, excited some interest at the Colonial and Indian Exhibition in Kensington in 1886. It belongs to the order of Podostemaceæ, and generally it grows under the water, where beds of the plant can be seen. In the dry season, when the river shrinks and the plant is exposed, it takes advantage of the opportunity to flower and fruit. After the fashion of sea-weeds, it adheres to rocks by a disc-like root, and it holds its ground in the most violent rapids.—*Colonies and India.*

CEYLON TEA FOR AUSTRALIA.—Australian buyers are again suggesting that our teas for their market should be packed in 40 lb. packages, in place of the ordinary 50 to 60 lb. half chests. Dealers in the Southern Colonies are accustomed to the smaller boxes and no doubt prices slightly higher—1 or 2 cents per lb.—would be paid for tea in such packages. It might be worth the while of planters who look to sales in the local market to try some breaks in 40 lb. boxes. The danger would be that buyers for the English market would not compete.—Since writing the foregoing the following extract from a letter for "the Colonies" has reached us:—

"We would suggest to growers, who, we are sure, are anxious to meet the demands of the Colonial trade, that they pack a fair proportion of half-chests weighing from 40 to 45 lb. net. We feel sure that growers would obtain a higher price at the sales for good breaks (80 to 100 half-chests), medium to good medium, Pekoe souchongs and pekoes."

COCONUT BEETLES.

Mr. Hale of Tampin sends the following notes to the Journal of the R. A. S. about the coconut beetles, which seem worth recording :—

"The natives here (Tampin) have the following names for this insect in the larval stage *Lembetah* and *Kelematah.* The latter means "that which tickles the eye (sight being understood), and the former is probably derived from it." Kelemata, originally Gelemata, may, he thinks, be derived in the following way : —"Malay women are generally slightly hysterical, and seeing a lump of these larvæ wriggling about in a vessel would make a Malay woman squirm (I can find no better word) and would give her a feeling of being tickled which she would so express. The large millipede I have known to cause the same sensation to Malay men who are particularly nervous." This suggestion seems quite a possible one for the derivation. One may compare Forbes's account of his throwing a woman into a state of *latah*, by flicking a caterpillar upon her, and I have known a syce unable to look at a death's head caterpillar which I was carrying without violent shuddering and horror."

Mr. Hale adds :—"The larvæ are very much relished by Malays, and I myself ate several of them and found them particularly sweet and nice, having a flavour like a fried filbert. The way to cook them is to put them alive into a pan over a slow fire and fry them until they are crisp. In the process of cooking they exude a quantity of a clear sweet nutty-flavoured oil (100 larvæ will yield about half a pint). This is believed by Malay women to be a most excellent hair-oil, and is much used by them for that purpose to encourage the growth of girl's hair. The perfect insect is called Kumbang Jenti, Kumbang Kalapa and Buang, but all of these names are applied indifferently to other large beetles."

Mr. Ridley says, in the the same publication,

"Towards the end of last year, on examining the contents of a pitcher of the common pitcher plant *Nepenthes ampullacea*, Jack) which was growing in the jungles in the Botanic Gardens, I was surprised to find three larvæ of one of the mosquitoes living and apparently thriving in the water of the pitcher. Carefully cutting off the pitcher and keeping it in a bottle, I succeeded in two or three days, in rearing two of the larvæ to maturity. The mosquito larvæ are not very particular as to the water they live in is known to every one who has ever watched them, but it is certainly very remarkable to find them living and thriving in the Nepenthes, which is so speedily fatal to any other insect which chances to fall in.'—*S.F.Press*, March 11th.

MR. H. F. BLANFORD ON CEYLON.

(From the Hills.)

Mr. Blanford, in his "Elementary Geography of India, Burma and Ceylon," traces the Taprobane of the Macedonians, to "copper water." We have heard of the copper-coloured palms of Wijaya's soldiers who fell to the earth on landing in our island, but the copper water is new to us. We have always felt a strong inclination to believe in the botanical origin of the name, from the Tamana tree, whence Tamankaduwa, the forest of Tamana trees. It is interesting to be reminded that the area of Ceylon is three-fourths that of Ireland. In saying that all the Ceylon rivers save the Mahaweliganga are mere mountain torrents, Mr. Blanford is scarcely correct. The Walawe, the Kelani and the Mahaoya are good-sized rivers, the Kelani, indeed, being navigable for large-sized boats for some thirty miles from the sea. The Mahaweliganga is described as rising under Pidurutalagala, the reference being to the Nanuoya, which with many other affluents forms the Kotmaleganga, and joins the Adam's Peak branch at Pasbage, below Nawalapitiya. But the Agraoya which rises under Kirigalpotta and the Dambagastalawa which flows down the Elk Plains from Totapala. and which unite belo the Agras, are really the chief sources of ou greatest river, the Agraoya being the farthest from the sea. As a matter of fact the actual sources of the Mahaweliganga can be seen on the great table-land of Horton Plains, 7,000 feet above sea-level. Besides not knowing that our mountain railway has been now for some years extended from Nawalapitiya to Nanuoya and is being extended across our mountain system into Uva, Mr. Blanford was ignorant of the fact that Sir Arthur Gordon had added two further Provinces, those of Uva and Sabaragamuwa, to the seven enumerated in the geography. Kandy is not quite 1,700 feet above sea-level, instead of 2,000, although the mountains immediately surrounding the mountain capital rise to altitudes of over 4,000 feet. In the case of Badulla the altitude is represented by the curious combination of four figures 2, or 2,222 feet above sea-level. Cinnamon, no doubt, grows wild in our forests, but it is the cultivated spice which has been for many years exclusively exported. The price has fallen so low that it would not now pay to collect "Korle cinnamon." With the exceptions noticed the brief account of our island is correct. Our climate, and especially that of our mountain sanatorium, Nuwara Eliya, is fully dealt with in the same author's able and interesting work on the "Climates and Weather of India, Burma and Ceylon." But with the one sanatorium of Ceylon, *as yet* (for the lofty and extensive table-land known as Horton Plains, 7,000 feet above sea-level, richer in soil than Nuwara Eliya, must surely be opened up and settled as the railway traffic begins daily to pass its base)—with our *one* mountain health resort and the *thirteen* scattered over India, from south to north, I must deal in a subsequent communication.

INDIAN PLANTING NOTES.

DHUDHUR ALLI, March 2.—Rainfall this week 1·42; total to date 2·25. Thermometer highest 75, lowest 57. Rain has changed the appearance of the whole country about here, and there is a perceptible change in the climate warning us of the hot weather's approach. In the Garden. "Hoeing" and "Tipping" are about the only works going on.

CHARALI, March 3.—Weather seasonable. We have had several welcome showers of rain. Early pruned bushes almost ready for tipping. The D. M. R. were inspected at Tezpore on the 25th ultimo when all the Bishnauth Division turned up except one man. The station officials don't seem to take much interest in volunteering as everyone of them cleared out to the Mofussil.

NAGRAKATA, March 6.—We are having very seasonable weather and the expected rain fell in heavy showers on the 5th instant. Rainfall up to date 1·04 against 1·15 last year.

DARJEEING, March 7th.—Yesterday was a nasty cold day with ¾ inch in rain. Clearer today. With sun, leaf should commence to come on strong. Cold weather works finished on most gardens; and all manufacturing houses ready for the commencement of plucking.—*Indian Planters' Gazette.*

TEA EXHIBITS AT THE AGRI-HORTICULTURAL SHOW AT MADRAS.

We have been favoured by the Honorary Secretary of the Agri-Horticultural Gardens with a copy of the Calcutta Tea Broker's Report on the teas exhibited at this show.

WOODCOTE ESTATE.—Valuation 1s 3d per lb. Leafy and small broken Pekoe, fair tip, brisk, rather light, little flavory.

KODANAAD ESTATE, Kotagiri.—(2 exhibits) No. 1. Valuation 1s 2d per lb. Small close black Pekoe leaf, fair tip, rather brisk, light.

No. 2. Valuation 11d per lb. Dark Pekoe kind, rather broken, fair tip, fair strength, rather coarse, poor quality.

GLENDALE ESTATE, Coonoor.—(2 exhibits) No. 1. Valuation 1s 6d per lb. Rathor bold, curly Pekoe leaf, fair trip, brisk, good flavor, light.

No. 2. Valuation 2s 2d to 2s 4d per lb. Small Pekoe leaf, good tip, little full brisk, good flavor.

TERRAMIA ESTATE, Coonoor.—1s 5d per lb. Curly dark Pekoe kind, rather broken, mixed with ends, little flavory, liquor wants pungency.

PARRY & CO., South Wynaad.—Valuation 10d per lb. Dark mixed Pekoe leaf, rather stalky, mixed with ends, thin, poor quality.

Glendale estate obtained the gold medal, and Woodcote estate the silver medal.—*Madras Times*, March 7.

THE DEMORALIZED QUININE MARKET IN AMERICA.

The action of one of the manufacturers in reducing the price on small packages of quinine to a figure very close to the quotation for bulk has completely unsettled the market without apparently causing the increase in the demand usually following closely upon such a radical change. There seems to be nothing in the position warranting such a decided departure from ordinary practices, and the explanation given in our market report last week, that the step was instigated by the recent publication of the views of a former manufacturer, accompanied by an offer to sell small packages at unusual low prices, appears in the absence of more definite reasons to have furnished the incentive for the move. Since the break was announced with as much publicity as the parties making the announcement could command, it has been met by most of the agents of the foreign makers and that fact h s resulted in a further decline. The price first named on five ounce packages by the domestic manufacturer referred to was twenty-five cents not, but the subsequent competition impelled him to offer an extra inducement to jobbers by allowing them a discount of five per cent. One of the foreign brands is now offered at twenty-four cents, less one per cent for cash and it has been intimated that some sellers might accept even less. The fact that buyers have not responded with any degree of alacrity to the flattering propositions made by the sellers has robbed the situation of some of its importance. The apathy of the jobbers is probably due to their knowledge that retailers, under the existing condition can do almost if not quite as well as they and that they therefore have no inducement to buy more than they need to fill current orders.

The market for bulk goods in spite of circumstances that should contribute to a weak feeling is fairly steady. At the same time speculative interest is almost entirely withheld and were it not for the brisk consuming demand caused by the presence of the grip and malarial diseases in the South and West, the market would present a dull appearance. Many are disposed to believe that the present war of rates is only a temporary matter and that it will be followed by a very decided reaction during the spring if not sooner.—*New York Drug Reporter*, Feb. 4th.

D. MORRIS, M A., F.L.S.

(From the *Jamaica Gleaner*, with a portrait.)

Mr. D. Morris, so favourably known and esteemed in Jamaica, was another of the prominent personages who arrived yesterday in the packet from Barbados. Mr. Morris is on a special tour of the West Indies for the purpose of encouraging the agricultural industries in these islands and increasing the usefulness of the several botanical stations. He has visited most of our sister islands and has delivered addresses to large audiences in each, stirring up their interest in the industries peculiar to the island they live in. Here also no doubt we shall see and here a good deal of one at Jamaica's warmest friends. It may not be amiss to give a few brief details of the career of Mr. Morris. Mr. Morris is a native of Swansea, South Wales, and was educated at Cheltenham, and Royal School of Mines, London; was senior moderator and first gold Medallist, and took natural science honors at Trinity College, Dublin, receiving the degree of B. A., in 1876 and M. A., in 1880. He was appointed by the Earl of Carnarvon, assistant to Dr. G. H. K. Thwaites F. R. S., C. M. G. at the Royal Botanical Gardens, Ceylon, in 1877. He was next placed on special duty, in the Coffee Leaf Disease Inquiry, in that island in 1879 and publicly received the thanks of the "Planters' Association of Ceylon" for services in connection therewith, as also special commendation from Sir Michael Hicks-Beach, and an honorarium equal to one year's salary. Appointed Director of Public Gardens and Plantations in Jamaica in 1879. He was engaged on a special mission to Grenada and Trinidad to report on the cultivation of cacao in 1882 and in the same year he visited and reported on the economic resources of the colony of British Honduras. He was appointed Chairman of the Jamaica Committee of the Amsterdam Exhibition in 1883 and in the same year he visited and reported on the resources of the island of Helena at the request of Lord Derby, and was appointed a member of the Government Committee on Fibre Plants. In 1884 he prepared a report on "Planting Enterprise in the West Indies" which was presented to both Houses of Parliament and in the same year 1883 he was Chairman of the Institute of Jamaica. In the following year he went as Commissioner for Jamaica to the World's Exposition at New Orleans where he was instrumental in getting the quarantine restriction removed against Jamaica. He was appointed in 1886 Assistant Director of the Royal Gardens at Kew and left the island amid the regrets of all who knew him. He has since done good work at Kew and this year he has come out to the West Indies on the mission referred to. Mr. Morris is author of "The Colony of British Honduras" of "The Agricultural Resources of the island of St. Helena," "Cacao, how to grow and how to cure it," "The Mongoose on Sugar Estates in the West Indies," "The history and cultivation of Liberian Coffee" and numerous other works treating on the distribution and cultivation of economic plants in the West India Islands.

THE CONSUMPTION OF SUGAR.

Uncle Sam has a sweet tooth. It has been suspected for some time; now there are figures to show it. The latest statistics reveal the fact that the United States consumes more sugar than any other nation in the world. Year by year the human family has been developing its taste for sweet things, the consumption of sugar of various kinds having steadily grown faster than the race has multiplied. And year by year the States and territories making up this hustling "Yankee nation," have in their use of sugar been as steadily gaining on the average consumption *per capita*, until now our 62,500,000 are found to have beaten the record, not only in the total amount consumed as a country, but probably in the average per inhabitant as well. It seems that we used about 50 lb each, last year, or, to be more exact, near 3,100,000,000 lb in all. The rest of the world consumed nearly 10,000,000, lb. It will doubtless be news to a great many people in the United States to learn that of this vast quantity of sugar consumed by the different nations, over 60 per cent is made from beets. It is only a few years since beet sugar was first brought into the market, but from the time of its introduction the quantity of it used has steadily gained on that of cane sugar. In 1884 and 1885 the quantity of each was about equal; the season of 1885-6 placed beet sugar in the lead, and each year's work has given it a little advantage, until now the world consumes 7,700,000,000 lb of sugar made from beet, as against 5,011,000,000 lb of sugar made from cane. The relative quantity of the two kinds consumed in the United States at present is not in the same proportion; beet sugar being less than one-fifth of the whole amount. But there are strong indications of a

very rapid change in this respect. For instance, we import four-fifths of all the sugar we use; the amount of cane sugar imported last year was no larger than that of the year before, while the importation of beet sugar was nearly four times greater than it was the previous year. This was an exceptional increase, to be sure, but the growth has been steady for some years past; and when to these significant facts are added the successful commencement of beet sugar making and the tremendous interest now being taken in the possibilities of the industry, it will be seen that the probabilities are altogether in favor of both the production and consumption of beet sugar in this country soon exceeding that of sugar made from cane. The position of beet sugar among European products is thus stated in a pamphlet issued by the Oxnard Beet Sugar Co., of Grand Island, Neb.: "Beet sugar paid the the Prussian war debt in France, and has done more to make the people wealthy than any other thing. Last year Germany produced 1,220,000 tons of beet sugar—more than any other nation. Austria followed with 730,000 tons, France with 700,000 tons, Russia 480,000 tons Belgium with 195,000 tons, Holland 60,000 tons. Total production 3,445,000 against 2,764,457 tons in 1888, and 2,451,900 tons in 1887. This is the most successful agriculture in Europe. It will soon make the farmers of Nebraska who raise sugar beets rich and stimulate all other interests."

[The above is from the "Sugar Bowl," published in New Orleans. In the same paper occurs the following paragraph on the very exceptional riches in saccharine matter of sugar cane grown in Louisiana:—

As a Sugar Country.—*Louisiana Equals the Tropics.*—Judge O. B. Sansum, a native of the West India island of Bermuda, we believe, where he was reared as a sugar planter, is enthusiastic over the future of sugar in Louisiana. He says last season we grew richer cane than he ever heard of in that country, and he thinks we can compete with the world in sugar production. To prove this, he shows an analysis of cane which he grew on the pine lands of Tangipahoa, which polarized 16·1 per cent in sugar! Not only the pine lands, but also many other sections last year made cane nearly as rich in sucrose.
—Ed. *T. A.*]

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Feb. 26th.

Cinchona.—Tuesday's bark sales offered a fairly extensive supply, distributed as follows:—

	Packages		Packages	
Ceylon bark	956	of which	665	were sold
East Indian bark ..	1,526	do	1,203	do
Java bark	66	do	40	do
South American bark	183	do	56	do
Total	2,731	do	1,954	do

The assortment was a poor one, and the auctions were altogether lacking in spirit, large piles being bought in at nominal prices because the limits fixed for them could not be obtained. On the whole the market was decidedly easier, and the unit price can scarcely be said to have averaged $1\frac{1}{4}$d per lb.

The following are the quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick work	164,370
Agents for the Mannheim and Amsterdam works	119,284
Agents for the Auerbach works	41,782
Messrs. Howards & Sons	38,838
Agents for the French, Italian, &c., works	35,075
Agents for the Frankfort o/M. and Stuttgart works	29,008
Sundry druggists	37,018
Total quantity sold ...	466,375
Bought in or withdrawn	158,943
Total quantity offered ...	625,318

Quinine.—Business has been very quiet this week, and the market closes weak and lower. A few days ago 5,000 oz. second-hand German bulk were reported sold at $10\frac{1}{2}$d per oz., and today there are further sellers at that price, but no one ventures to buy.

London, March 12th.

Annatto.—Bright Ceylon seed is repored to have been sold privately to some extent at the rate of $2\frac{1}{2}$d per lb.

Cinchona.—The supply of bark offered at Tuesday's auctions was exceedingly small. The catalogues comprised:—

	Packages		Packages	
Ceylon bark ...	575	of which	561	were sold
East Indian bark ...	587	do	476	do
Java Bark ...	3	do	—	do
South American bark	360	do	248	do
Total ...	1,525	do	1,285	do

The assortment was a poor one, and does not call for any special observation. A quiet tone prevailed, and there was no quotable change in the prices. The unit remains at about $1\frac{1}{4}$d per lb. Fine bright Succirubra chips and shavings for druggists are scarce and realise comparatively high prices, with good competition.

The following are the quantities purchased by the principal buyers:—

	Lbs.
Agents for the Brunswick works ...	36,080
" Mannheim and Amsterdam works	145,117
" Frankfort o/M and Stuttgart works	24,468
" American and Italian works ...	22,042
" Auerbach works ...	20,266
Messrs. Howard & Sons	18,090
Mr. Thomas Whiffen	1,780
Sundry druggists	19,690
Total quantity sold	288,033
Bought in or withdrawn	52,829
Total quantity offered	340,862

Java Cinchona.—Three cases good druggists' stem quills were bought in at 1s per lb.

South American Cinchona.—Of 246 packages cultivated Bolivian Calisaya, 215 packages were sold (27,180 lb.) at $7\frac{3}{4}$d per lb. for fair broken quill; 5d to $5\frac{1}{2}$d for quilly chips, and $1\frac{1}{2}$d per lb. for very common twigs. Twenty-nine bales damaged Pitayo, and 4 bales ditto soft Colombian, via Hamburg, sold at 2d per lb. A parcel of 75 bales damaged Carthagena, also via Hamburg, is held for 6d per lb. The next Amsterdam sale will take place on April 2nd. The shipments from Java continue large, the steamer "Sumatra" which left Batavia on January 29th, carried about 75 tons of bark. The exports of cinchona from Java are given as follows by Messrs. Böhirnger & Sons:—From July 1st, 1890 to February 27th, 1891, about 2,400,000 kilos.; from July 1st, 1889 to March 1st, 1890, 1,758,000 kilos. On the other hand the arrivals by rail in Colombo show a considerable decline, the figures being: January 1st to February 23rd, 1889, 575 tons; same period 1890, 415 tons; January 1st to March 1st, 1891, 260 tons:

The arrivals from Southern India this week have been very heavy, the S. S. "Stentor," which arrived on March 5th, alone brought 1,729 packages from Calicut and 480 from Beypore.

Essential Oils.—Citronella without business, at $\frac{5}{8}$d to $\frac{3}{4}$d per oz. Lemon grass also quiet at $1\frac{1}{2}$d to $1\frac{3}{4}$d per oz.

IMPORTATION OF UNSOUND TEA.

The Collector of Customs having been requested by the Colonial Treasurer to report on the statements of a deputation to the effect that unsound tea condemned in Melbourne was being imported into Sydney, forwarded to the Government Analyst six samples of the questionable tea, and asked for a report, the three points to be determined being—(1) Whether the tea was of the following standard—30 per cent. of extract, 3 per cent. of soluble ash, calculated on the dry tea 212 degrees Fahrenheit, or more than 8 per cent. of total ash. (2) Whether the tea represented by the samples contained any ingredient injurious to the health of possible consumers. And (3) Whether the tea was unfit for human consumption. To these questions the Government Analyst replied as follows: Government Laboratory, Sydney, 25th February, 1891,—Sir,—I have the honour to submit the result of my analyses of the samples of tea, which are

found to be as follows :—

Percentage of Mineral Ash.	Percentage of Extract.	Percentage of Soluble Ash.	Percentage of Theine.	Percentage of Insoluble Ash.
6·20	27·88	3·03	0 69	68·50
6·23	23·20	3·28	1·37	67·95
6·56	30·10	3·62	1·55	64·28
6·07	29·80	3·26	1·40	65·54
6·18	25·76	3·47	0·81	67·16
5·87	27·30	3·07	0·68	69·05

In reply to the request contained in your letter the above results will, I think, answer your first question as regards quality. The sample third on the list passes the standard for genuine teas. To the second question,—viz., as to whether the tea represented by these samples contains any ingredient injurious to the health of possible consumers,—I am able to answer in the negative. With reference to the third and final question,—as to whether these teas are fit or unfit for human consumption,—I am of opinion that they are fit for human consumption, one of them passing the standard adopted by different Governments and institutions. In the Public Health Bill now awaiting the attention of the Legislature definite standards are provided under which five out of the six teas would have been condemned as unfit for human consumption. The fact, however, remains that all the samples are of very inferior quality. I am, &c. William M. Hamlett, F.I.A., F.C.S., Government Analyst." On this report the Colonial Treasurer has expressed the opinion that in the present state of the law it is not possible to prohibit the importation of the tea in question, which, with the exception of one sample, is found to be of lower quality than the standard adopted by any other colony. He, however, regards the report of the Government Analyst as satisfactory evidence that the tea does not contain any ingredient injurious to the health of possible consumors, and that it cannot be considered unfit for consumption. The adoption of a standard regulating the quality of imported tea will be considered when the proposed Public Health Bill is introduced.—*Sydney Mail.*

TEA PLANTING IN UVA.

The Haputale and Madulsima Companies, on the principle of "Hobson's Choice" we fancy, are following the many examples set them by estates originally opened for the cultivation of coffee and cinchona and are now going largely in for tea. Mr. George A. Dick and Mr. Arthur Scovell (two good men and true—most experienced and reliable planters) have recently joined the Ceylon Board of management, a fact which argued well for the future success of the two Companies in question. "It is a long lane that has no turning" and we heartily and trustfully anticipate a good time coming for both the Haputale and Madulsima, as for other Uva Planting Companies.

LARGE PURCHASES OF ESTATE PROPERTY.

The Ceylon and Oriental Investment Corporation, Limited, have just acquired the group of lowcountry estates comprising about 1,500 acres,—about one-third in tea—belonging to Mr. Jeronis Pieris. There are five estates (Wilton, Moralioya, Pathragalla, Narthupana and Deegalla) situated in the Awisawella and Kalutara districts, all of them more or less planted up with tea. The negotiations were finally closed yesterday afternoon by Mr. J. Huntley Thring, and Mr. E. G. Harding on behalf of the Company, and Mr. W. H. Davies on behalf of the seller. Mr. Thring, the Managing Director of the Corporation, returns to England per S. S. "Kaiser-i-Hind," after a successful business trip through the planting districts.

TRINIDAD SUGAR PLANTERS AND THE McKINLEY BILL.

Last month a majority of the Trinidad sugar planters called on the American consul, Hon. Wm. Pierce, and read an address correcting the impression that their immigration tax is an "export duty in disguise," depiving them of the benefits of free entry of their sugar in the United States. Their address is interesting. It cites that when, 45 years ago, slavery was abolished there, the sugar industry would have been extinguished but for the act permitting introduction of East Indian immigrants, on a ten year contract—five years' indenture to the planters who employ them, at an indenture fee of £5 per head and an immigration tax on their produce; the second five years they being free to hire where they please. They stated :—As a result, there are now 70,000 East Indians in Trinidad, in a total population of 200,000, and, as a further result, the exports of the colony have increased in a most remarkable and satisfactory manner.

Mr. Pierce promised to lay their views before our Government. During the interview he spoke of our recent legislation as follows :—The sugar producers of the United States had expended more or less money in the way of sugar estate improvements, upon the idea that the sugar industry was being protected by a heavy import duty. For the Government to have thus encouraged them to make those improvements and then to greatly diminish the value of the same by taking off the custom house duty on imported sugar, would be unjust, if some way had not been found to compensate them for their loss, and their bounty, which is only to last till 1905, was doubtless intended as such compensation.—*Farm Journal.*

THE INDISCRIMINATE PLANTING OF TREES IN OOTACAMUND.

[The conclusion of the discussion on alleged excessive tree planting in Ootacamund contains the commonsense of the matter. It is evidently a minute by the chief Government officer of the district, in his capacity of Chairman of the Municipality.—ED. *T. A.*]

Notes on the influence exercised by trees on climate by Dr. Balfour, printed at page 410. Madras Journal 1849-50. In this reference is made to the fact that the climate of Canara became drier, the seasons more uncertain and the land less fertile, since the tract was denuded of forest and Dr. Balfour adds "I have also understood that effects of a similar kind have been experienced at the Nilgiri Hills." The whole of the notes is very interesting and a summary of the beneficial results of trees are given at page 445. The notes were highly commended by Minutes of Consolation dated 8th September 1848. No. 981 *The atmosphere by Flammariar page* 280 and 281. There the advantage of trees in point of temperature is fully explained. There are other books and papers in which the planting of trees is highly commended, and there is not a word in them pointing to any dis advantage in a place like Ootacamund. Ootacamund is located in an extensive valley which permits of the free course of the winds and which is sufficiently inclined to allow of good natural drainage from every part of it," page 48 of the District Manual.

"The climate * * * for the greater portion of the year is decidedly salubrious. The air is pure and bracing, and has a sensible affect in exhilarating the spirits and increasing the disposition to exercise." Same book-page 48.

The area of the Municipal town is nearly 12 square miles. The excessive planting complained of is not apparent to any one who looks around. On the other hand, the portions on the East and West seem to be markedly bare. The direction of the winds is chiefly from the West and North (page 49 of the Manual.)

The existing plantations have been formed first for shelter and in later years for profit; but they are by no

means excessive, regarded either in point of sanitation or local requirements. The complaint has been as reported by Dr. Balfour, that Ooty has become drier than it was 15 or 20 years ago and this change is attributed to deforestation. As to the 2nd conclusion of the Sub-Committee vide para (8), it appears clear that the Municipal Council can take action under the present sections of the Act in regards to Acacia Wattle, and undergrowth *containing decayed vegetation and noxious matter.* Otherwise, no interference can be exercised, nor is it necessary or expedient to ask for power to do so, as however unsightly such growth may be it is a source of profit and living to several people in the town. The poor people use it for fuel and Wattle has a commercial value as tanning material, although no one has availed himself of the advantage: As to conclusion 3, (vide para 8), the Sub-Committee has not proved by statistics the evil said to have resulted from trees and undergrowth and what evils are feared in the future. The law reports to which I carefully referred make this particularly clear. You cannot restrict the number of trees growing in existing plantations without fully compensating the owners, nor can you restrict future planting in private land without very seriously interfering with private rights. This must be demonstrated before Government can be induced to legislate in the direction pointed out. The Sub-Committee's proposals involves a serious interference with private rights and vested interests, calculated to depreciate the property very considerably. It is a maxim of law that "A legislative enactment ought to be prospective, not retrospective, in its operation." "The laws are adapted to those cases which most frequently occur." There is no wrong without a remedy." "In law the immediate, not the remote, cause of any event is regarded." "Enjoy your own property in such a manner as not to injure that of another person." If Government takes into consideration the amendment of the law as recommended, the restriction in regard to past plantations can only be enforced on payment of compensation to the owners concerned as explained by the above maxim the analogy of section 168 (3) of the present Municipal Act.

I would recommend the Council to pass a resolution in general terms to the effect that after fully considering the vegetation existing within Municipal limits it considers that existing plantations cannot be interfered with without interfering with private rights to an unwarrantable extent as it is not prepared to compensate owners for the value of all trees to be cut out of existing plantations.

II. That as regard Wattle, it will endeavour to effectually deal with this pest by the continuous issue of notices to clear.

III. That it appoints a standing Sub-Committee to watch vegetation and to report instances of noxious vegetation for want of notices to clear. The members of the Sub-Committee in fact to divide the inspection of the town among them. I don't think this is asking too much, as with one or two exceptions the Commissioners don't do very much inspection. That as regards future plantations, the Government be requested to obtain the opinion of the Advocate General as to the competence of the Council to pass and of the Government to sanction, the passing of a bye-law prohibiting the planting of any tree except purely ornamental trees without the sanction of the Council previously obtained. The question bristles with legal difficulties and is eminently one for the Advocate General to adviso.

It has just occurred to me that the Council might very fairly ask the Government to help in reducing the timber area within Municipal limits by closing their depot. Purchasers would thus be driven to private producers of firewood and private plantations would be reduced in area.—*S. I. Observer.*

MIDDLING PLANTATION COFFEE is quoted by Reuter at 109s 6d per cwt., but sales have been effected by Colombo firms within the past few weeks at as high a figure as 115s per cwt. delivered cost and freight at Trieste, while it has exchanged hands locally at R72 per cwt.

CEYLON COCOA.

BY DR. A. J. H. CRESPI.

One of the most curious features of modern commercial activity is that Nature is, as it were, compelled to improve on her own earlier efforts. Supposing that some much-prized plant is found to do well in a particular region with a climate of given warmth and under certain recognised conditions: the next thing is to find out a region where those conditions are still better, and to introduce the plant there. This seems to have been done with the cacao tree in Ceylon, and cocoa superlative excellence has for many years been manufactured from cacao beans imported from that beautiful island. Some brands of Ceylon cocoa have been recently commanding very high prices; this shows what a magnificent field exists in Ceylon for cocoa culture, and that the quality of the cocoa from that island is far above the average of West Indian varieties. The principal peculiarity of the Ceylon brand is its delicate flavour and rich aroma; although when prepared for use its price is not very high, and quite within reach of most incomes. We confidently predict that as it becomes more generally known, it will be sold in still larger quantities, and so open up a fresh and most important branch of trade to British enterprise.

Messrs. J. S. Fry and Sons, the well-known makers, whose house was founded in 1728, were not slow to recognise the peculiarly delicious flavour of Ceylon cocoa, and they have accordingly added another luxury to our household beverages in the form of Ceylon chocolate, a speciality that is being much appreciated by connoisseurs. While on the subject of Ceylon cocoa, we have just been favoured with some of the most recent statistics relating to the consumption of cocoa in England. Although a great authority gives the average consumption as five ounces per head, it is now ascertained to amount to eight, or to be more precise, in 1889 it reached 18,464,164 pounds. This is not a large total after all, but marks progress. In 1820, duty was only paid on 267,000 pounds; in 1875, on 9,900,000 pounds. In other words, the consumption has doubled in fourteen years, and should the present rate of progress continue another fourteen or fifteen years, the trade will reach, for the first time, very respectable dimensions.

Considering its fragrance and nutritive properties (for all preparations of cocoa are a true food, and valuable as tissue restorers and force producers), perhaps the small consumption is surprising. For our part we prefer well-prepared cocoa to all other beverages, while indigestion, which is so frequently caused, or at any rate, aggravated by the too liberal use of hot tea, does not follow cocoa. The cocoa trade is in a healthy and active state, and the wants of the general public are not likely to be neglected as long as so many leading English firms busily engaged ministering to the national needs.

One of the best uses to which Ceylon chocolate can be put is to eat it when on tricycling or pedestrian excursions. We have it most convenient, and we believe that cyclists, who are often at a great loss for a portable and palatable food which they can eat without dismounting, will more and more trust to chocolate as their sheet-anchor. Long before our attention had been directed to the subject by a circular we were reading the other day, we had found out the value of dry and satisfying food when many miles from home and pressed for time. —*Hardwicke's Science Gossip.*

ECHOES OF SCIENCE.

According to a paper read by Professor Maisch at the Philadelphia College of Pharmacy, the camphor tree is being cultivated on an extensive scale in Florida. It grows rapidly there, and seems to flourish in any kind of soil. Professor Maisch estimates that in ten years there will be more camphor than orange groves in that State. The quality of the gum obtained is more like that of Japan than China, the odour of safrol being quite sensible.

An American contemporary records the blood-poisoning of several greenhouse workmen through contact with a plant known as the Chinese primrose (*Primula obconica*). It is a native of Central China, and was first cultivated from the seed in England about ten years ago, when it created some stir owing to the beauty of his winter blossom. It has, however, the property of irritating and even of poisoning the skin of some people who touch it, producing an inflammation resembling eczema. The sting of the leaves will sometimes last for several days.

Quite recently Mr. W. H. Weed, of the United States Geological Survey, has proved that plants of a low grade are important agents in the production of travertine, tufas, and sinters, hitherto believed to be the effect of inorganic chemistry. The abundance of algæ in hot springs has often been observed, but passed over as a curiosity of biological science, in spite of the well-known fact that certain water-plants extract carbonate of lime from its solution. Some years ago the present writer drew attention to the fact that most of the "coral sand" on a certain West Indian Island is really the calcareous skeleton of a sea-weed, and not, as was imagined, the *débris* of rock coral. Cohn, a German naturalist, has shown that vegetation is an agent in the production of travertine in the Carlsbad springs.—*Globe.*

TEA: FINE PLUCKING AND HIGH AVERAGES.

(*From a correspondent.*)

I think there can be little doubt Alnwick and Portswood pluck fine, though they do not admit it. The samples at the Exhibition in Nuwara Eliya looked so. If according to Wilson, Smithett & Co's. account, Portswood only made 20,000 to 30,000* lb. last year there is no wonder the average was high. You will find wherever they make quantity the average will go down, or I am very much mistaken. Generally speaking, it will never pay to make fine teas unless you could make a large quantity and that would be impossible.

NUWARA ELIYA EXHIBITION AND TEA PRIZES.

A planting correspondent writes:—

"In giving the prizes at Nuwara Eliya for Ceylon teas of breaks to be sold,—that is, the samples *were supposed to be* of breaks to be sold,—"Alnwick" received the gold medal, and Portswood the silver medal, the teas from the latter having averaged 1s 4d all round for 1890, the estate never having EVEN BEEN ONCE *below the first average* out of all the monthly sales during the year. Alnwick for the same period was at 1s 1½d—see Wilson & Smithett's Circular (Ceylon Tea Memoranda for 1890) published in March 1891:—

"Alnwick 56,000 lb. average 1s 1½d.
Portswood 45,000 lb. (sold some locally) 1s 4d.'

The Portswood teas sent to the Show, I believe, were drawn from the bulked tea by Mr. William Mitchell junr. in the Portswood tea factory."

* No—the return for Portswood is 45,000 lb., and extent in tea being 240 acres, but all will not be in full bearing. Alnwick is down for 56,000 lb. at an average of 1s 1½d last year, the *Directory* showing 235 acres in tea.—ED. *T. A.*

PORTSWOOD TEA AND LOCAL SALES.

The rates at which the Portswood teas were actually sold after last sale—R1, 72 and 62 cents—are so good and (as the Brokers tell us) so fully covered the reserve rates, that we think the proprietor is scarcely justified in grumbling about local sales. No doubt Mr. Grinlinton has got higher rates at home; but has he made full allowance for the different state of the market at different dates? So far from casting reflection on "local sales," we think the splendid prices realized here for Portswood teas last week, is about the strongest encouragement to sell teas locally that we have yet seen. As a matter of fact, the sale in London in February took place at a particularly good time, while a sale here at the end of March with the prospect of what the market may be towards May is a rather different matter. At any rate, we can only say: "Well done the Colombo market and the Colombo Brokers that got such splendid prices for Portswood teas last week."

CEYLON TEA.—The *Times* reports that a consignment of Tea from Ceylon, recently sold at Mincing Lane, was, in the opinion of experts, the finest Tea ever grown. It was ultimately sold for no less a sum than 87*s.* a pound; and again changed hands at £5 10*s.*—a price never before approached in the Tea trade. Bravo, Ceylon! Honour to the memory of the botanists in India, whose labours and discoveries more than half a century ago rendered such things possible.—*Gardeners' Chronicle.*

"KEW BULLETIN."—The January number comprises articles on the West African Bass Fibre, the produce of a Palm, Raphia vinifera. Chinese ginger, the preserved ginger of commerce, is, it appears, not a ginger at all, but the produce of Alpinia galanga, which is said never to flower in China but which has been obliging enough to do so at the Hong Kong Botanic Garden, as well as at Dominica. The remainder of the numbr is taken up with correspondence relating to the production of seed in the sugar-cane, and the consequent possibilities of new varieties being originated.—*Gardeners' Chronicle.*

CLOSE PLANTING OF VINES.—That the practice of planting the Vine much closer together than 3½ to 4 feet is not always a failure, is shown in a photograph of a vinery with Vines in bearing (not suitable for reproduction), sent us by Mr. Richardson, gradener, Wood House, Stansted, Essex. The house is 50 feet long, and contains twenty-one canes of Black Alicante and Lady Downe's Seedling, planted at 2 feet apart. The crop seems, from the view taken in October, to have been a heavy one. In the long run we think that close planting would end in inferior crops for very obvious reasons. The weakening of the Vines would commence and go on with the exhaustion of the border, the yearly lessening size of the foliage, and the size of the annual wood.—*Gardeners' Chronicle.*

MORE ABOUT THE GARTMORE TEA.—The following is from the *Sunday Times* published in London:—

"Tea at £10 12s. 6d, a Pound!—A small lot of Ceylon tea from the Gartmore estate realised this ridiculously inflated price at a public auction at the Mincing Lane sale rooms. The tea is said to possess extraordinary qualities in liquor, and to be composed almost entirely of small 'golden tips,' which are the extreme ends of the small succulent shoots of the plant, and the preparation of such tea is of course most costly. I should like to know something more about the 'extraordinary qualities' of this two hundred-and-twelve shillings-and-sixpence a pound tea when it is in liquor.' Does it waken snakes? Will it make goats dance? Will it make to see comets, or feel like the Grand Turk? Well, the worth of anything is just as much as it will bring. It is a pity, nevertheless, that Sardanapalus and Cleopatra are deceased. They would perhaps have liked to invest in a small lot of 'golden tips' at £10 12s. 6d. per pound fortheir five o'clock teas."

CEYLON TEA IN 1890.

MESSRS. WILSON, SMITHETT & CO.'S REVIEW.

We give on page 766 the full text of this extremely valuable series of notes and statistics on the course of London sales of Ceylon Teas for last year, together with general statistics as to total imports, consumption and stocks of all teas in the United Kingdom. While Portswood estate heads the list with the highest average price of any Ceylon estates teas, K. A. W. has the honour of sending the largest quantity (568,000 lb.) from any Ceylon factory with the good average of 10½d. The leading position in price as regards districts of Bogawantalawa and the Nuwara Eliya neighbourhood, reminds us of the remark credited to Mr. Arthur Thompson that our highest-grown teas when shipped in sufficient quantity to keep up a regular supply, might well be marked "Ceylon-Darjeelings" to attract the special attention of buyers of fine teas. Has any shipper done this with high-grown teas and with what result, we should like to know. Kintyre green teas are referred to with commendation, and it is gratifying to see that both Russia and America are expected to be good customers of Ceylon teas in 1891. What is said about the size of bushes again merits careful attention. Dimbula of all districts sent the largest quantity of tea—5,700,000 lb.—at an average of 11¾d in 1890. It is very remarkable to note how the consumption of China teas in the United Kingdom had fallen from 106,310,000 lb. in 1835 to 57,500,000 lb. last year; while that of India and Ceylon had risen from 68,890,000 lb. to 136,500,000 lb. in the same period.

From Messrs. Geo. White & Co.'s Annual India, Ceylon and Java Tea Report, date 20th March, 1891, received today, we quote as follows:—

CEYLON.—When writing last year, we were able to chronicle a marked expansion in the Ceylon trade. Further decided progress has since then being made, the result being an increase in both imports and deliveries of about seven million lb. for the eight months ending 28th February last, the consumption having no doubt been stimulated to some extent by the reduction in duty. This is satisfactory, as it proves the steady and increasing demand existing for these growths, which also no doubt prevented the fluctuation in value seen in former years—the lowest monthly average during 1890 being 10d and the highest 11½d, whereas, in 1889, the range was from 9d to 1s 1¾d; the 545,000 packages sold during 1890, and 438,000 packages in 1889, having however, realised about the same price, viz., rather under 11d per lb. After Christmas, demand further improved in consequence of the statistical position, which was strengthened by the loss of the S. S. "Nepaul" and "Hong Kong;" but later on, owing to heavier arrivals and quiet country trade, there was less disposition to purchase. On the whole, quality has been desirable, there being a much smaller proportion of over-fired and sour Teas, though few ever really choice flavoured parcels, perhaps due to rather coarser plucking on some of the gardens. During the season, several little lots of "Golden Tips" have been sold, one at 30s. 6d., another at 87s., both of which were re-sold at large profits; and a third was knocked down at £10. 12s. 6d. per lb., after some very spirited bidding between two of the largest advertising firms.

FINE TEA.

There is both profit and satisfaction in handling fine tea. It makes trade. Customers, as soon as their attention is directed to the matter, will discover that there are pronounced differences in flavour and come to appreciate the delicate fragrance of a fine leaf, instead of, as now, being satisfied with any sort of an infusion so long as it is warm. It is not likely that a grocer will sell fine tea unless he is himself a lover of the beverage and can discriminate as to body and flavor, and last of all style. People will soon learn that a high-priced tea is very little more expensive than a cheap tea. The Ceylon factors impress upon their customers that their "money can go as far in $1 25 tea as in a 50-cent tea; that is good tea can be cheap." Then, consumers need to learn the art of making tea and acquire the habit of steeping it at the table.—*American Grocer.*

THE MICA INDUSTRY.

With the extraordinary growth of the electrical industry in the United States for a number of years past there has been created a new and steady demand for mica, which, curiously, has failed to stimulate the mica mining industry in this country; the most important mines, indeed, show a decided decrease in producing during this time, and the business is now in a depressed condition. In the construction of dynamos, electric motors and some other electrical appliances, mica is a very important element, valued on account of its flexibility and excellent insulating qualities. For this purpose, however, there is a decided preference for foreign mica, the Canadian "amber mica" being generally used.

Mica is employed in dynamos and electric motors, mainly in building up the armatures, strips of various dimensions, but unusually about one inch wide, and from four to eight inches long, being used.

The foreign mica is considered preferable to that of North Carolina for this purpose in that while the latter can be split into thin sheets, it is by no means so tough, which is an important requisite. Such mica may perhaps be found in the United States, but up to the present time there is no doubt that some imported micas have proved more suitable for this purpose than the usual domestic grades.

Hitherto the most important, in fact, almost the only important use for mica has been in stoves, and the demands, and consequently prices of the article for this purpose have been such that mica mining was carried on at considerable profit.

The chief mines in the country are in New Hampshire and North Carolina, but principally in the latter State, these producing an excellent quality of the mineral. Several years ago changes were made in the patterns of stoves whereby smaller and correspondingly less expensive sheets of mica were used, and the lower prices resulting depressed the industry greatly, especially in North Calidonia, where many mines were closed. The total value of the product in the United States decreased from 368,525 dols. in 1884, to 70,000 dols. in 1880. During the same time the imports of mica, which, prior to 1884, had been of but trifling importance, increased from 28,284 dols. to 57,541 dols. —*Engineering and Mining Journal.*

SILVER.—I note that the Mount Zeehan Tasmanian Silver and Lead Mining Company has received a letter stating that lodes have been now found of 8 feet and more, and, as some 3 feet was before about the limit, it is clear that the value of this mine is infinitely greater than many supposed. I am of opinion that Mount Zeehan will be but one of the many coming examples of the enormous mining wealth latent in Tasmania.—"*Anglo-Australian*" in *E. Mail.*

TALKING OF TEA reminds me that Her Majesty always has her tea from a quaint, old-fashioned shop in Pall Mall. It costs, I believe, five and fourpence a pound, and is called "Earl Grey's mixture," from having been recommended to the Queen by that nobleman. It is said that Her Majesty's five predecessors have patronised the same tea. It says a great deal for this mixture that amidst so much degeneration in the tea that there is now, it should have held its own so long.—*Cor., A. F. Press.*

WILSON, SMITHETT & Co.'s CEYLON TEA MEMORANDA FOR 1890.

London, March 1891.

The amount of Ceylon Tea brought to auction in London between January 1st and December 31st, 1890, was about 30 per cent in excess of the supply in 1889, and, it is satisfactory to note, realised the same average price as was recorded for that year, viz., 10¾d per lb., and only ½d per lb. less than in 1888, when the Imports were less than half those of the year under review.

The event of the year has undoubtedly been the reduction of the Tea Duty from 6d to 4d per lb. When in the early spring rumours were afloat as to the intention of the Chancellor of the Exchequer to partly utilise his surplus in thus relieving taxation the idea that Tea would be one of the articles touched was not generally credited; it was argued that if once reduced the old duty could never be re-imposed unless under most pressing circumstances, and that the reduction itself would give no relief to the poorest class of consumers who buy their tea in penny worths. The eventual decision of Mr. Goschen has, however, been gratefully acknowledged by a large section of tea-drinkers, and so far as Indian and Ceylon producers are concerned the boon was conferred at a most opportune time. The rise in silver, precluding any invasion of the market by low-class China leaf, the impetus given to the home consumption shown by the increase of 8,400,000lbs. in 1890 over that of the two previous years, operated entirely to the benefit of British-grown teas. The silver question itself threatened at one time to be of grave import to the industry, but the crisis once past it may reasonably be questioned whether the danger was not after all a blessing in disguise.

In taking a retrospect of the course of the market during 1890 we are chiefly struck with the comparatively uniform range of prices ruling throughout the twelve months; the average never sank to the low level it touched in the spring of 1889, whilst it failed to reach the high average attained in the autumn of that year. The fears of the trade as to any prospective over-supply were effectually allayed by the rise in silver, whereby the exports from China were considerably curtailed; and on the other hand, in the autumn, when the strong statistical position of the trade as a whole might have led us to expect a more important advance in values, a check was imposed by the wave of commercial depression caused by financial troubles, which at one time threatened to overwhelm the credit of the country.

Early in the year we enjoyed a very firm market for the lowest grades for price, but the better qualities soon commenced to recede in value, and the average price of 11¾d for the first week in January was reduced to 11d at the end of the month. In February a generally dull tone supervened, and operations were conducted in a very hand-to-mouth manner. At the earliest sales in March the market became very flat, and the quality of the offerings at this period was not calculated to counteract the downward tendency; the average price gradually declined, and one week was as low as 9¾d per lb. This low range attracted attention for a while, and some slight improvement took place; good Broken Pekoes and Pekoes, which showed the greatest depression, were more enquired for, and sold at enhanced values. A temporary flatness soon followed; in view of the possible reduction in the duty country buyers deemed it expedient to clear as little as possible, and dealers consequently also refrained from going into stock to an extent. After Easter, as the time for the disclosure of the Budget proposals approached, the chief buyers began to take advantage of the heavier sales to extend their operations in view of heavy clearing orders in the near future; finest qualities rose slightly in value, but the lowest grades were chiefly affected, medium qualities, for the time, being disregarded, and the average price for several weeks fluctuated from 10¼d to 10½d per lb. The reduction of the duty, in due course, was accepted very quietly, but if it did not cause any marked advance in prices, it was no doubt an important factor in preventing any decline at this usually depressed period. Throughout June and July a steady tone prevailed, the best teas were well supported, and indeed the fluctuations were principally effected by the quality of the offerings. On the 1st July the first New Season's Chinas were offered, and, with the exception of several of the finest lines which commanded very full rates for export, sold at a low range. In August, the generally poor quality of Indian and China directed more attention to Ceylon—more especially to the fine teas. In September the improvement became more accentuated, and the average price gradually rose to 1s ½d—the highest rate recorded in the year. In October the low rates ruling for ordinary Indian Pekoes unfavourably affected the corresponding grade of Ceylon leaf; but a good all-round demand prevailed, the finest invoices being strongly competed for. After the first week in November the market began to show signs of weakness and irregularity, particularly for the more undesirable sorts; common Souchongs declined ½d per lb., and the weekly average gradually receded, and at the closing sale of December stood at 11d per lb.

The issue of our Annual Circular has again been unavoidably delayed by the heavy amount of work entailed in summarising the results obtained by most of the chief estates in Ceylon, numbering over 450. It is quite possible, that, for reasons advanced on previous occasions, some slight miscalculation may be discovered; we can, however, confidently recommend our statistics as substantially correct for all intents and purposes, and, we trust, that all those whom our circular reaches will prove it so for themselves, and regard it as of some practical interest and value. We can only once more congratulate Planters and all concerned on the highly satisfactory state of the industry, and confide our researches to their favourable consideration and study. It will be remembered that whereas last year only five names appeared in the first group of estates aggregating over 200,000 lbs. seventeen are to be found this year, two of which, Mariawatte and the Kadawella group, have contributed over half-a-million lb. each. The fine teas of the New Dimbula Co., with a yield of 209,000 lbs., head the list with an average of 1s 1½d against 1s 1d per lb. last year closely followed by Wallaha with an output of more than double that quantity. In several other cases last year's average has not been maintained, but in many instances this is to be traced to rather freer plucking, and we doubt whether many more satisfactory results can be quoted than the average of 1s 0¼d per lb. for Chapelton with a yield of 450 lbs. an acre. In the second group Labukelle has given 15,000 lb. less tea, but has more than compensated by an increase of 2¼d per lb. in the average price realised; the fine delicate flavoury teas of this garden have sold largely for Russian account throughout the year. The next estate in the list—Kotiyagalla—whose Pekoes also have again found marked favour in the same market, has with an increased yield of 16,000 lbs., averaged 2¾d per lb. more than in 1889. Kirkoswald sending 43,000 lb. more has maintained the same average. Gleudevon with an increase of 20,000 lb., is only a ¼d per lb. behind, and Invery at a like small expense has increased its yield by about 70 per cent. In the third group Mooloya with a stationary yield has advanced 1d per lb.

The Highest average of all is that of Portswood viz:— 1s 4d, against 1s 4½d per lb. last year; perhaps no estate has so well maintained its distinctive character as this well-known mark.

Bogawantalawa and the country round about Nuwera-Eliya head the Districts with an average of 1s 0¼d, or 1½d above the average realised by the Ceylon Tea sold on the London Market; but the case of Dimbula will perhaps be considered the most satisfactory; the yield from this fine district we estimated last year at 3,800,000 lb., this year we put it at 5,700,000 lbs., with the same average, viz., 11¾d. Amongst the

remaining districts the most noticeable is a rise of ⅜d per lb. in the productive Kelani Valley.

During the past year the demand for Ceylon Tea on the Continent has developed considerably; a comparatively large business was done, principally with Russia, and we confidently look forward to a still greater distribution in this direction in the coming season. Several large lines of good useful Pekoe Souchongs have sold in the United States and in Canada, and we may also reasonably look forward to extended competition from this quarter in the future. The Ceylon Tea Co. in New York, founded at the close of last year, will doubtless prove a valuable medium for prosecuting this desirable enterprise.

Early in the spring of 1890 some especially fine Green Teas from Kintyre estate, attracted much attention and commanded very high prices; they did not, however, find a ready market in the country, and subsequent consignments were disposed of at much lower but still at satisfactory rates. The demand for this class of tea is restricted to a very small area at home and prices obtainable in America are not such as to encourage their manufacture on any large scale. The example of the above estate was followed by several others, but the quality of the teas was of a very inferior kind. Several small consignments designated Oolongs met with very languid competition, being dry and malty and totally lacking the distinctive character of the Formosa type.

The size of the breaks from many estates was much more satisfactory last year, and it is to be hoped their example will be more universally followed in the coming season. Much irregularity in prices will be saved if care is taken in this respect specially in the large proportion of medium qualities. In times of heavy supply the large lines will always secure the most attention, except in cases of tea of particularly fine quality, when their marked superiority naturally compels competition. The surprise experienced at the varying prices sometimes realised for different marks, actually counterparts are one of the other, is almost always assignable to this cause.

WEEKLY PUBLI AUCTIONS OF CEYLON TEA during 1890 with average price realised;—

Week ending.		Number of Pkgs. offered in auction.		Avg. price per lb.		Av. Price per lb. for corresponding week 1889.
				d.		d.
Jan.	4th	526	...	11¾	...	10¾
	11th	14,152	...	11½	...	10¼
	18th	10,345	...	11½	...	10¼
	25th	8,147	...	11½	...	10¼
Feb.	1st	12,646	...	11¼	...	10¼
	8th	8,205	...	11	...	10¼
	15th	9,144	...	10¾	...	10¼
	22nd	8,793	...	10¾		10¾
March	1st	11,000	...	10½	...	10¾
	8th	10,950	...	9¾	...	10½
	15th	7,130	...	10¼	...	10¼
	22nd	10,596	...	10¼	...	10¼
	29th	12,940	...	10¾	...	10½
April	5th	4,277	...	10½	...	10¼
	12th	no sales	...	—	...	9¾
	19th	15,729	...	10¼	...	10½
	26th	17,050	...	10½	...	10
May	3rd	10.590	...	10¼	...	9¾
	10th	12,219	...	10½	...	9½
	17th	8,619	...	10½	...	9½
	24th	18,268	...	10½	...	9¼
	31st	2,534	...	10	...	9½
June	7th	22,856	...	10½	...	9¾
	14th	12,0[illegible]8	...	10¾	...	9¼
	21st	15,500	...	11¼	...	9
	28th	15,753	...	11	...	9
July	5th	8,384	...	10¾	...	9½
	12th	14,418	...	10¾	...	10
	19th	8,934	...	10¾	...	10¾
	26th	14,293	...	10½	...	11¼
Aug.	2nd	16,268	...	10¼	...	11½
	9th	2,947	...	10	...	10¾
	16th	19.369	...	10½	...	11¾
	23rd	17.966	...	10½	...	1/0¼
	30th	9,650	...	10¾	...	11¾
Sept.	6th	18,900	...	11	...	/0½
	13th	7,457	...	11¼	...	1/1¼
	20th	9,414	...	1/	...	1/1¼
	27th	812,90	...	1/0¼	...	/1¼
Oct.	4th	14,800	...	1/	...	1/1¾
	11th	7,184	...	1/	...	1/2
	18th	9,434	...	11¼	...	1/2
	25th	9,233	...	11¾	...	1/2¼
Nov.	1st	8,233	...	1/	...	1/1¾
	8th	4,708	...	10/¼	...	1/1¼
	15th	5,440	...	1/	...	1/0½
	22nd	10,613	...	11¾	...	11¾
	29th	10,313	...	11	...	1/
Dec.	6th	7,460	...	11¼	...	11¾
	13th	14,147	...	11	...	11¾
	20th	7,207	—	11	...	11¾

SUMMARY OF CEYLON TEA SOLD AT PUBLIC AUCTION in London between January 1st and December 1890, estimated quantity in lb. and averaged prices realised:—

Average price for the Year 10⅝d per lb., against 10⅜d in 1889, and 11⅛d in 1888.

The initial letters following the estate names refer to the mean elevation, as follows:—

L (low) sea level up to 1,000 feet—H M (high medium) 2,500 to 3.500 feet—H H (highest) above 5,000 feet—M (medium) 1,000 to 2,500 feet—H (high) 3,500 to 5,000 feet.

Over 200,000 lb.		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Diyagama	H...	209,000	1	1½	1	1
Wallaha (CTP) Co.	HM...	484,000	1	0¾	1	1¼
Chapelton	H...	224,000	1	0¼	1	1¼
Campion	H...	228,500	0	11¾	0	11½
Galaha	M...	250,000	0	11¾	0	11¾
Mattakelly	H...	206,500	0	11¼	0	10¾
Glenalpin	H...	221,000	0	10¾	0	11¾
Gallamudina	M...	226,000	0	10½		—
Imboolpittia	M...	271,000	0	10½	0	11¼
K A W	HM...	568,000	0	10½	0	11
Dunedin (CTPCo.)	L...	201,000	0	10¼	0	9¼
Vellai-oya (EP&ECo.)	H...	325,500	0	10¼	0	11½
Darrawella (OBEC)	H...	200,500	0	10	0	10¾
Mariawatte (CTPCo.)	M...	541,500	0	9¾	0	11
Gallebodde	M...	200,000	0	9½	0	11
Sunnycroft	L...	203,000	0	9½	0	9
Lebanon Group	M..	203,000	0	9¼	0	8
100,000 lb. to 200,000 lb.						
Labukelle (EP&ECo.)	H..	101,000	1	3¼	1	1
Kotiyagalla	H..	109,000	1	3	1	0¼
Drayton	H..	145,000	1	1½	1	2
Kirkoswald	H..	176,500	1	1¼	1	1¼
Waverley	H..	100,000	1	1	1	1
Glendevon (OBEC)	H..	122,500	1	0¾	1	1
Bambrakelly & Dell	H..	197,500	1	0½	1	1¼
Invery (SCTCo.)	H..	127,000	1	0½	1	0¾
Tillyrie (CTPCo.)	H..	176,500	1	0¼	0	10
Ythanside	H..	122,000	1	0¼	1	0¼
Bogawautalawa	H..	117,000	1	0	1	1
Glenugie	H..	180,500	1	0	1	2½
Hope (EP&ECo.)	H..	176,000	1	0	0	11¼
Mahacoodagalla	H..	137,000	1	0	0	11
Ragalla	H..	107,500	1	0		—
St. Clair	H..	111,000	1	0	1	2¼
Annfield	H..	111 000	0	11¾	0	11
Hauteville	H..	127,500	0	11¾	1	0
Moray	H..	189,500	0	11¾	1	0½
Vallombrosa	H..	115,000	0	11¾	1	1¾
Bearwell	H..	124,000	0	11½	0	11½
Fordyce (LPCo.)	H..	109,500	0	11½	0	11¼
Gorthie	H..	124,500	0	11½	0	11¾
Rookwood	HH..	186,000	0	11½	0	11¼
Scarborongh	H..	115,500	0	11½	0	10¾
Strathdon (SCTCo.)	HM	137,000	0	11½		—
Venture	H..	114,000	0	11½	0	11
Dunsinane	H...	111,500	0	11¼	1	0¾
Holyrood, E	H...	106,000	0	11¼	0	9½
IMP	H...	111,000	0	11¼	1	0¼
Lynstead	H...	106,500	0	11¼	0	11¾
Spring Valley	H..	181,000	0	11¼	0	10½
Waltrim	H...	124,500	0	11¼	0	10½
Wangieoya	H...	124,000	0	11¼	0	10¾
Wattegodde	H...	110,500	0	11¼	0	11¼
Adam's Peak	H...	124,000	0	11	0	10¼
Calsay	H...	129,000	0	11	1	0
Craigie Lea (OBEC)	H...	150,500	0	11	1	0

		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Kabragalla, M	H...	106,000	0	11	0	10½
Le Vallon	HM...	128,000	0	11	1	0
Lindula	M...	100,500	0	11	0	11¾
Mipitiakande	L...	148,000	0	11	1	0¼
Sogama (EP&EC)	HM...	143,500	0	11	1	0½
Alton (CTPCo.)	H...	123 000	0	10¾	0	9½
Kataboola	H..	108,000	0	10¾	0	11¼
Barnagalla	M...	150,500	0	10½	0	11¼
Castlemilk	M...	102,500	0	10½	0	11¼
Elkadua	HM...	156,000	0	10½	0	10¾
Hoonoocotua	H...	110,000	0	10½	0	10¾
Hunugalla	H...	103,000	0	10½	0	11¾
Kellie	M...	199,500	0	10½	0	10
Kudaoya (OBEC)	H...	114,500	0	10½	0	10
Laxapana	H...	147,500	0	10¾	0	11
Meddecombra (EP&ECo.)	H...	191,000	0	10½	1	0
Nilambe	HM...	130,000	0	10½	0	8½
Osborne	H...	109,000	0	10½	0	11
Abbotsford	HH...	116.500	0	10¼	0	9¼
Choisy & Rolleston	H...	111,500	0	10¼	0	11¼
Dalleagles	M...	109,000	0	10¼	0	10
Dikoya	H...	120,000	0	10¼	0	9½
Doteloya	M...	153,500	0	10¼	0	10
Elston	L...	134,500	0	10¼	0	10½
Glencairn	H...	126,000	0	10¼	0	10
Goorokoya	M...	113,000	0	10¼	0	10½
Great Western	H...	199,500	0	10¼	0	11
Hardenhuish and Lammermoor	HM...	121,000	0	10¼	0	10¼
Hatale	H...	134,500	0	10¼	0	11½
Hindagalla	M...	139,000	0	10¼	0	11
New Peradeniya OL&PCo.	M...	152,000	0	10¼	0	10½
Pen-y-lan	M...	164,000	0	10¼	0	9¾
Andangoddie (OL&PCo)	M...	161,500	0	10	0	10½
Arapalakande (EP&ECo)	L...	132,000	0	10	0	10
Hill Side	M...	103,000	0	10	0	9
Katooloya	H...	157,500	0	10	0	10½
Penrith	L...	132,000	0	10	1	0
Tyspany	H...	121,000	0	10	0	10½
Westhall	HM...	154,500	0	10	0	9¾
Dewalakande (CTPCo)	L...	133,000	0	9¾	0	10
Pambagama	L...	175,000	0	9¾	0	9½
Blackwater	M...	194,000	0	9½	0	9½
Delta	H...	112,500	0	9½	0	9½
Hunasgeria	H...	169,000	0	9½	0	9½
Kelani	L...	105,000	0	9½	0	9½
Narrangalla	M...	107,500	0	9½	0	11
Sembawatte	HM...	117,000	0	9½	0	10
Yataderia	L...	155,000	0	9¼	0	11
Yellangowry	M...	137,000	0	9¼	0	10
Aberdeen	HM...	130,500	0	9	0	9½
Kandaloya	M...	182,000	0	9	0	9¾
Luccombe	HM...	142,000	0	8½		—

50,000 lb. to 100,000 lb.

		About lb.	Av. price per lb. 1890. s.	d.	1889. s.	d.
Mooloya	H...	56,500	1	2½	1	1½
Pita Ratmalie	H...	58,500	1	1¾	0	11¼
Alnwick	H...	56,000	1	1½	1	3½
Henfold	H...	54,000	1	1		—
Kandapola	HH...	96,500	1	1	1	0¾
Pundaluoya	H...	50,500	1	1	1	0¼
Eltofts	H...	60,500	1	0¾	0	11½
Goatfell	H...	85,000	1	0¾	1	3¼
Kew	H...	88,000	1	0¾	0	11
North Cove	H...	74,000	1	0¾	0	10¼
St. John del Rey	H...	69,500	1	0¾	1	1¼
Erlsmere	H...	60,500	1	0½	0	10½
Errol	H...	63,000	1	0¼	0	10½
Cullodon	L...	78,500	1	0	0	10¾
Scrubs (CTPCo)	HH...	73,000	1	0	0	11½
Bogahawatte	H...	74,500	0	11¾	1	2
Brunswick	H...	58,000	0	11¾	0	11½
Elbedde	H...	99,500	0	11¾	1	0
Mahanilu	H...	69,500	0	11¾	1	0
Mayfield	H...	96,500	0	11¾	1	0¾
Mincing Lane (SCTCo)	H...	60,500	0	11¾	1	0½
Nayabedde	H...	55,500	0	11¾	0	10¼
St. Vigeans	H...	52,500	0	11¾	0	11
Albion	H...	72,500	0	11½	0	11½
Glassaugh	HH...	65,000	0	11½	1	0¼
Kandenewera	HM...	53,000	0	11½	0	10
Loolcondera (OBCE)	H...	64,500	0	11½	1	1¼
Mocha	H...	79,000	0	11½	1	0¼
New Forest	H...	56,500	0	11½	1	0
New Valley	H...	71,500	0	11½	0	11¼
Norwood (EP&ECo)	H...	75,500	0	11½	1	2
Poengalla	HM...	81,000	0	11½	0	10½
Rangbodde	H...	93,000	0	11½	1	0
Rangalla	HM...	80.000	0	11½	1	0¼
WA	H...	70,000	0	11½	0	11
Agra Ouvah	H...	76.000	0	11¼	0	11¾
Balmoral	H...	68,000	0	11¼	0	11¾
Beaumont	M...	78,000	0	11¼	0	11¾
Claverton	M...	67,000	0	11¼	1	0
Glentilt	H...	68,000	0	11¼	0	11¼
Hornsey	H...	50,000	0	11¼	0	10½
Lawrence	H...	78,500	0	11¼		—
Mount Vernon	H...	91,000	0	11¼		—
Newton	H...	58,500	0	11¼	0	11¼
Summerville	H...	66,000	0	11¼	1	0¼
Fetterosso	HH...	94,000	0	11	0	10¼
Geddes	H...	75,000	0	11	0	11
Gikiyanakanda	L...	76,500	0	11	0	11¾
Glentaaffe	H...	62,500	0	11	1	0
Heeloya	H...	62,000	0	11	0	11½
Lippakelle	H...	74,000	0	11	1	0
Talawakelle	H...	80,000	0	11	0	11¼
Theresia	H...	51,500	0	11		—
Windsor Forest	M...	70,500	0	11		—
Blair Athol	H...	58,500	0	10¾	0	10
Doragalla	HM...	79,500	0	10¾	0	10¾
Fairlawn	H...	53,500	0	10¾	0	11¾
Glengariffe	H...	51,500	0	10¾	0	11
Kadienlena	M...	63,500	0	10¾	0	10¼
Kirrimittia (EP&LCo)	M...	51,500	0	10¾	0	11¼
Lamiliere	H...	72,000	0	10¾	0	10¾
New Peacock	H...	82,500	0	10¾	0	9
Niloomally (OBEC)	H...	88,500	0	10¾	1	0
Oliphant	HH...	55,500	0	10¾	0	9¼
Oodewelle	HM...	54,500	0	10¾	1	1¼
Sanquhar	HM...	51,000	0	10¾	0	10¾
Sinnapittia (OBEC)	M...	71,500	0	10¾	0	11½
Somerset	H...	75,500	0	10¾	0	11½
Templestowe	H...	81,000	0	10¾	1	0¼
Atherfield	L...	64,000	0	10½	0	10¾
Bloomfield	H...	66,500	0	10½	0	10¾
Castlereagh	H...	67,500	0	10½	0	11
Dedugalla	M...	60,500	0	10⅓	1	0
Dessford	H...	72,500	0	10½	1	0
Dimbula	H...	98,500	0	10½	0	11½
Galloola	H...	83,000	0	10½	0	10½
Glendon	L...	58,000	0	10½	0	10
Great Valley	HM...	51,500	0	10½	0	11
Havilland (OBEC)	M...	91,000	0	10½	0	10½
Kalcogalla	HM...	72,500	0	10½	1	1
Kabragalla (M)	H...	77,500	0	10½	0	10½
Kelaniya	H...	59,000	0	10½	0	10
Marguerita	HH...	53,000	0	10½	0	11½
Minna	H...	84,500	0	10½	0	9¾
Nayapane	HM...	66,500	0	10½	1	1¼
Needwood	H...	56,000	0	10½	0	10¼
Norton	HM...	50,500	0	10½	0	9¾
Ounonagalla	H...	91,000	0	10½	0	9¾
Ottery	HM...	96,000	0	10½	0	10¾
Ovoca	H...	79,000	0	10½	0	11½
Peradenia	H...	69,500	0	10½	0	11¾
Rickarton (OL&PCo)	HM...	71,000	0	10½	0	11¼
Torrington	H...	65,000	0	10½	0	10¼
Torwood	L...	57,500	0	10½	0	9¾
Uva	H...	74,500	0	10½	0	9¼
Wewolmadde	M..	66,000	0	10½	0	10½

		About lb.	Av. price per lb, 1890.		1889.	
		£,	s.	d.	s.	d.
Weyweltalawa	M...	64,000	0	10½	0	10¾
Agra	H...	64,500	0	10¼	0	10
Avisawella	L...	73,500	0	10¼	0	9¾
Degalessa	L...	77,500	0	10¼	0	10¾
Dunkeld	H...	70,500	0	10¼	0	10½
Gammadua	H...	93,500	0	10¼	0	10
Gangwarily	M...	50,500	0	10¼	0	9¾
Hayes	M...	81,000	0	10¼	0	8¾
Kallebokka	H..	58,500	0	10¼	0	11¼
Kelvin	M...	72,500	0	10¼	0	9¾
Lauderdale	HM...	60,500	0	10¼	0	9½
Maha Eliya	H...	70,000	0	10¼	0	10¼
Mahalma	L...	56,000	0	10¼	0	11¼
Orwell	M...	71,000	0	10¼	0	9½
Polgahakande	L...	62.500	0	10¼	0	10½
Putupaula	L...	62,500	0	10¼	0	10¼
Queensberry	H...	61,000	0	10¼	0	11½
Raxawa	HM...	67,000	0	10¼	0	10½
Shrubs Hill	HM...	73,500	0	10¼	1	0½
Stonycliff	H...	67,000	0	10¼	0	9¾
Wattylakel	H...	80,000	0	10¼	0	11¾
Dambulagalla	H...	93,500	0	10	0	11
Densworth	L...	80,500	0	10	0	10½
Ernan	L...	56.500	0	10	0	10
Gallaheria	H...	93,000	0	10	0	9¾
Gingranoya	HM...	53 500	0	10	0	11¼
Glassel	L...	89,500	0	10	0	10¼
Goomera	H...	93,500	0	10	0	11
Hatherleigh	M...	67,000	0	10	0	8¾
Heatherly	M...	81,000	0	10	0	11
Ingurugalle (E P & E Co.)	M...	70,500	0	10	0	10¾
Leangapella	H...	68,000	0	10	0	9¾
Mahatenne	M...	56,000	0	10	0	9¾
Mottingham	...	83,500	0	10	—	
Nyanza	HM...	68,500	0	10	0	10
Parusella	L...	64,000	0	10	0	9¼
St. Helens	M...	57,000	0	10	0	9¼
Strathellie	M...	66,000	0	10	1	0
Troy	L...	54,000	0	10	0	9¼
Tunisgalla	H..	67,500	0	10	0	11½
Cottaganga	H..	54,500	0	9¾	0	10
Emelina	H..	88,500	0	9¾	0	10½
Glenalla	L..	63,500	0	9¾	0	10½
Happugahalanda	M..	68,000	0	9¾	0	9¼
Lankapura	H..	87,000	0	9¾	1	0¼
Lavant	L..	88,000	0	9¾	0	9½
Ambetenne	L..	61,000	0	9½	0	9½
Digalla	L..	57,000	0	9½	0	9½
Ivanhoe	H..	500	0	9½	0	10
Knuckles Group	HM..	63,000	0	9½	—	
Binoya	HM..	75,000	0	9¼		9¾
Coooawatte	..	52,000	0	9	—	
Indurana	L..	65 500	0	9¼	0	9¾
Barra	M..	85,500	0	8½	0	8½

20,000 lb. to 50,000 lb.

Portswood	HH..	45,000	1	4	1	4¼
PDM	H..	28,500	1	2	1	0¼
Sheen	H..	47,500	1	2	1	3½
Charley Valley	H..	39,000	1	1¾	1	2
Condagalle (EP&ECo.)	H..	43,000	1	1½	1	0¾
Denmark Hill	HH..	36,000	1	1½	—	
Loinorn	H..	35,500	1	1½	1	1¾
Onvahkellie	H..	31,500	1	1½	1	0½
Elgin	H..	42,500	1	1¼	—	
Frotoft	H..	48,500	1	1¼	1	0¾
Heathersett	H..	46,500	1	1¼	1	2¼
Hoolankande	HM..	36,500	1	1¼	1	9
Hantane	M...	43,500	1	1	0	10½
Warwick	H...	25,000	1	1	0	11¼
Wootton	H ..	38,000	1	1	1	0
Agarsland	H...	29,500	1	0¾	0	11¼
Bramley	H..	35,500	1	0¾	0	11
Combewood	HM...	25,500	1	0¾	—	
Court Lodge	HH...	22,500	1	0¾	1	0
Edinburgh	H...	44,500	1	0¾	1	0
Mahagastotte	H...	26,000	1	0¾	—	
Upper Cranley	H...	22,000	1	0¾	—	

		About lb.	Av. price per lb. 1890.		1891.	
Agrakande	H...	38,500	1	0¼	1	1¾
Braemore	H...	37,500	1	0¼	0	9¾
Dammeria	HM...	24,500	1	0¼	—	
Deeside	H...	48,000	1	0¼	1	0¼
Glasgow	H...	34,000	1	0¼	1	1
Macduff	H...	39 000	1	0¼	—	
Melfort	H..	44,500	1	0¼	0	11¾
Brownlow	H .	21,500	1	0	—	
Friedland	HH...	35,500	1	0	0	10¼
Gartmore	H...	31,500	1	0	—	
Gonakelie	HM...	20,500	1	0	0	11
W. Holyrood	H...	28,000	1	0	0	9½
Kowlahena	H...	27,000	1	0	1	0½
Middleton	H...	25,000	1	0	0	11¼
Muliguseny	...	43,000	1	0	—	
Poolbank	H...	28,500	1	0	1	0
Broughton	H...	39,000	0	11¾	1	2
Devonford	HH..	34,500	0	11¾	—	
Rahatunagoda	H..	38,000	0	11¾	1	0¼
Suriakande	H..	49,500	0	11¾	0	9¾
Thornfield	H..	48,500	0	11¾	0	11
Clontarf	L..	46,500	0	11½	—	
Dunnotar	H..	23,000	0	11½	—	
Gonomotava	H..	48,500	0	11½	1	0¼
Hatton	H..	29,000	0	11½	0	11¾
Morar	H..	48,000	0	11½	1	0
Rajatalawa	HM..	28,000	0	11½	1	1
Aadneven	H..	23,500	0	11¼	0	10
Bathford	H..	32,000	0	11¼	1	0¼
Detenagalla	H..	34,000	0	11¼	0	10½
Dunlow	H..	43,500	0	11¼	0	10¾
Frogmore	H..	34,000	0	11¼	0	10¼
Heatherton	HM..	28,500	0	11¼	—	
Ingestre	H..	29,500	0	11¼	—	
Kirklees	H..	36,000	0	11¼	0	11½
Mahousa	M..	41,000	0	11¼	1	0¼
New Caledonia	H..	48,000	0	11¼	0	11¼
Panmure	H..	30,000	0	11¼	0	9½
Portree	H..	38,000	0	11¼	—	
Stellenberg (OBECo.)	H..	48,500	0	11¼	—	
Broad Oak	H..	35,000	0	11	0	10¼
Cattaratenne	HM..	23,500	0	11	—	
Deanstone	H..	34,500	0	11	0	11
Fruit Hill (LPCo)	H..	48,000	0	11	0	11
Holmwood	H..	34,000	0	11	0	9
Hopton	HM..	20,500	0	11	—	
Kelliewatte	H..	45,000	0	11	0	10½
Maskeliya	MM..	36,000	0	11	—	
Nicholoya	HM..	25,500	0	11	1	0
Pansalatenne	M..	44,000	0	11	0	10½
Penrhos	M..	36,000	0	11	0	11¼
Pine Hill	M..	27,500	0	11	0	11¾
St. John's	H..	41,000	0	11	—	
Aigburth	HM..	26,500	0	10¾	0	10
Ampittia (LPCo.)	H..	49,000		10¾	1	1¼
Bitterne	H..	45,500	0	10¾	0	9¾
Blackstone	H..	45,500	0	10¾	1	0¾
Caskie Ben	H..	35,500	0	10¾	0	11
Dangkande (OBECo)	HM	37,000	0	10¾	0	11½
Delpotonoya	H..	38,500	0	10¾	0	10½
Ferndale	H..	49,500	0	10¾	0	11¼
Galella	H..	26,000	0	10¾	0	8¼
Haputale	H..	24,000	0	10¾	—	
Kintyre	H..	52,000	0	10¾ }	0	10¼
—,,— (Green)	H..	13,500	1	1¼ }		
Meria Cotta	H..	32,500	0	10¾	0	11¼
Relugas	HM..	22,000	0	10¾	—	
Tommagong	HH..	39,000	0	10¾	1	0
Warriapola	M..	39,000	0	10¾	0	10½
Wavahena	M..	31,500	0	10¾	1	0½
Wellekelle	H..	26,000	0	10¾	0	11
Zululand	M..	21,000	0	10¾	—	
Aldie	H..	20,500	0	10½	—	
Amblamana	HM..	47,000	0	10½	1	0¾
Battagalla	H..	21,000	0	10½	0	10¼
Battalgalla	H..	44,000	0	10½	—	
Craig	H ..	40,000	0	10½	0	10
Duckwari	HM..	27,000	0	10½	—	
Epplewatte	M..	43,000	0	10½	0	10
Glencoe	H..	47,000	0	10½	0	9
Kinloch	H..	30,500	0	10½	—	
Kottagalla	H..	28,500	0	10½	—	

		About lb.	Av. price per lb 1890. s.	d.	1889. s.	d.
Lagalla	HM..	33,000	0	10½	0	11
Little Valley	HM..	33,500	0	10½	—	
Loonagalla	HM..	35,500	0	10½	—	
Madoolkelle	HM..	21,500	0	10½	0	9½
Midlands	HM...	46,000	0	10½	0	10¼
Mount Pleasant	HM...	28,000	0	10½	—	
Mousakelle	H...	41,500	0	10½	0	10
Old Madegama	HM...	38,500	0	10½	—	
Riverside	M...	40,500	0	10½	—	
Situlaganga	H...	25,000	0	10½	—	
Taprobana	H..	38,000	0	10½	1	0
Theberton	HM...	22,000	0	10½	0	8½
Verelapatna	H..	24,500	0	10½	0	11½
Berragalla	H..	36,500	0	10¼	0	11¾
Campden Hill	M..	22,000	0	10¼	0	9
Ohetnole	HM..	39,500	0	10¼	0	10¾
Deyanella	M..	35,500	0	10¼	1	1
Fassifern	H..	23,500	0	10¼	—	
Gona	M..	34,500	0	10¼	—	
Kaluganga	L..	29,000	0	10¼	0	9¼
Karagastlaawa	H..	29,500	0	10¼	1	2½
Kelburne	H..	38,500	0	10¼	—	
Marlborough	H..	27,000	0	10¼	—	
Melrose	HM..	33,000	0	10¼	—	
Ooragalla	M..	40,000	0	10¼	—	
Oppalgalla	HM..	31,000	0	10¼	1	0½
Peacock Hill	HM..	42,500	0	10¼	1	2½
Sclegama	HM..	23,000	0	10¼	0	8½
St Leys	H..	40,000	0	10¼	0	10¾
Ugieside	M..	33,000	0	10¼	0	8
Warleigh	HM..	41,500	0	10¼	0	9¼
Wiltshire	HM..	25,000	0	10¼	0	10½
Woodcote	M..	28,000	0	10¼	0	9½
Woodstock	H..	31,000	0	10¼	0	11¾
Yarrow	HM..	21,500	0	10¼	0	11¾
Amunamulle	H..	40,000	0	10	0	11¾
Beverley	M..	41,000	0	10	0	9
Bismark	H..	41,000	0	10	0	9¾
Brae	—..	37,000	0	10	0	8½
Dahanaike	HM..	30,000	0	10	0	10
Damblagolla	HM..	36,000	0	10	0	9½
Doronakande	L..	39,500	0	10	0	9¾
Ekolsund	H..	44,000	0	10	0	10
Heminford	L...	44,500	0	10	—	
Lower Haloya	M...	49,500	0	10	0	9
Maryland	M..	29,500	0	10	—	
Pasbagie		31,500	0	10	—	
Salem	M..	27,000	0	10	—	
St. Helens	M...	43,500	0	10	0	9¼
Stockoholm	H..	24,500	0	10	—	
Wereagalla	L..	26,500	0	10	0	9
Agra-oya	M .	30,000	0	9¾	0	10¼
Ardross	L...	39 000	0	9¾	0	9
Arslena	M..	46,000	0	9¾	—	
Blackwood	H..	22,500	0	9¾	1	0¼
Cabragalla		34,500	0	9¾	—	
Ederapolla	L...	40,000	0	9¾	0	9¾
Galaty	M..	31,000	0	9¾	0	10½
Gavatenne	HM...	27,500	0	9¾	0	10¾
HGA	H..	45,000	0	9¾	0	9¾
Hangranoya	M..	31,000	0	9¾	0	9½
Koladenia(EP&ECo,)	M...	34,500	0	9¾	0	8¾
Matara-oya		31,500	0	9¾	—	
Warriagalla	M...	27,000	0	9¾	0	10
Wattawelle(OBECo.)	M..	47,000	0	9¾	0	9½
Dalguise	HM...	40,500	0	9½	—	
Dehiowita	M...	29,500	0	9½	—	
Ellagalla	M...	37,000	0	9½	—	
MK	HM..	28,500	0	9½	0	10
Putiya	..	25,000	0	9½	—	
Saumarez	L..	48,500	0	9¼	0	9½
Amblakande	M..	39,500	0	9¼	—	
Balgowrie	L..	27,000	0	9¼	0	7½
Donegama	H..	30,500	0	9¼	0	10½
Laxapanagalla	M..	42,000	0	9¼	0	8¼
Morton	L..	34,000	0	9¼	0	8¾
Nrrtakande	M..	37,000	0	9¼	0	8¼
Orion	M..	23,000	0	9¼	0	10½
Aoerfoyle	HM..	41,000	0	9	0	9½
Coolbawn	M..	20,500	0	9	0	10
Florence	M...	27,500	0	9	0	8
Hiralouvah	HM...	22,000	0	9	0	10½
Lyegrove	M...	26,500	0	9	0	10
St. Leonards	L...	24,500	0	9	0	9½
Udabage	L...	35,500	0	9	0	9½
Gallewatte	HM...	27,000	0	8¾	0	8¾
Kenningten	ML...	22,500	0	8¼	—	
Kurulugalla	HL...	22,000	0	8¼	0	10
Topare	HM	30,000	0	7¾	—	

Estimated relative Yield and Average price realised for the diifferent CEYLON TEA DISTRICTS compiled from the Public Auctions held in London between January 1st and December 31st, 1890:—

	lbs. about	Av. Price per lb. about	Av. Price per lb. in 1889. about
Bogawantalawa ...	1795000 ...	1/0¼ ...	1
Newara Eliya, Maturata & Uda Pusselawa	1450000 ..	1/0¼ ...	1/0½
Dimbula	5700000 ...	0/11¾ ...	0/11¾
Hewaheta	1050000 ...	0/11½ ...	0/11½
Pusselawa, Kotmale, Pundaloya and Ramboda	3050000 ...	0/11¼ ...	0/11¼
Dikoya	3000000 ...	0/11 ...	0/11½
Matale & Hunasgeriya	1550000 ..	0/11 ...	0/10½
Kelani Valley ...	2800000 ...	0/10¾ ...	0/10
Maskeliya	2750000 ...	0/10¾ ...	0/11
Uva	1500000 ...	0/10¾ ...	0/11
Kalutara	750000 ..	0/10½ ...	0/10½
Nilambe and Hantane	1050000 ...	0/10½ ...	0/11
Ambegamuwa, and Lower Dickoya	2800000 ...	0/10¼...	0/10¾
Kaduganawa & Aalagalla	750000 ..	0/10¼ ...	0/10¾
Knuckles, Kallebokka, Rangalla &c. ...	1900000 ...	0/10¼ ...	0/10¾
Dolosbage and Yacdessa	2550000 ..	0/10 ...	0/10
Saberagamua	750000 ...	0/10 ...	0/9½
Galle	150000 ...	0/9¼ ...	—
Lower District ..	35000 ..	0/9 ...	0/9¾

N.B.—Untraceable marks to the extent of about 3,000,000 lb. averaging 9¾d per lb. are not included in the above estimate.

HOME CONSUMPTION of China and East Indian growths 10 years ago, 5 years ago, and last year:—

	China. lbs.	Indian & Ceylon. lbs.			
1880	111,307,000	43,807,000	or 28¼ p. c.	of the	total.
1885	106,310,000	68,890,000	,, 39½	do	do
1890	57,500,000	136,500,000	,, 70½	do	do

N.B.—In 1889 the consumption of Indian and Ceylon was 67⅔ per cent.

Monthly Deliveries of Ceylon Tea during the past five years.

	1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
January	2215670	1945932	1029318	535280	285400
February	2126498	1915114	1060546	494520	235390
March	2081078	2137838	1084850	616230	316790
April	1334678	2165016	1238420	657420	316240
May	5019890	2893385	1305960	779130	429380
June	3613768	2667890	1594208	780570	569710
July	3932286	3667728	2266106	998590	766310
August	3793038	3200918	2116702	1341790	817780
September	3960440	2900718	1873396	1197220	786520
October	3640690	2655188	1885440	1008950	683770
November	3162432	2177092	1689480	790010	566240
December	2772302	1889324	1408134	741900	471210
	37652770	30216143	18552560	9941610	6244740

Monthly Imports of Ceylon Tea during the past five years:—

	1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
January	2573914	2660244	1356784	578250	226160
February	3051404	1971772	1261250	713490	394470
March	3008554	2476842	1243966	746280	399480
April	3403832	3257796	1106462	679000	705180
May	4067074	2681694	2015920	886780	692730
June	3693204	3649132	2139242	1230240	623560
July	5142768	2883564	2040074	1650270	880820
August	3508780	1716628	2412362	1178610	813870
September	3244802	2673498	1452408	781570	681406
October	2371260	1953520	1681792	815110	427160
November	3056966	2518050	1588964	872330	499750
December	2888626	2746054	201 462	1193030	530320
	40011184	31189794	20324286	11324960	6874900

STOCK of Ceylon tea in Bonded Warehouses at the close of the past five years:—

1890.	1889.	1888.	1887.	1886.
8,621,824 lbs.	6,303,954 lbs.	5,129,978 lbs.	3,149,430 lbs.	1,660,460 lbs.

Board of Trade Returns of Imports and Home Consumption of Tea from all Countries during the past five years:—

From	1890. lbs.	1889. lbs.	1888. lbs.
Brit. East Indies	146,260,642	127,160,409	113,004,692
,, China	73,635,351	88,848,574	105,424,271
Other Countries	4,758,378	5,593,677	5,189,515
Imports ...	224,654,371	221,602,660	223,618,478
H. Consumption	*194,008,492	†185,621,800	185,556,214

From	1887. lbs.	1886. lbs.
Brit. East Indies ...	97,830,117	80,987,351
,, China ...	119,739,116	145,111,596
Other Countries ...	5,194,054	4,796,345
Imports	222,763,287	230,895,292
Home Consumption...	183,635,885	178,894,151

* Of this total 101,961,666 lbs. were Indian, 34,516,469 lb. Ceylon, 54,873,592 lb. China, and 2,656,745 lb. from other countries.

† Of this total 124,408,798 lb, were British East Indian, 59,513,397 lbs. China, and 1,699,600 lb. from other countries.

Exports of Tea (of all kinds) during the past five years.—

1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
*36,967,137	35,661,900	37,956,840	34,741,390	44,413,050

* Of this total 2,624,579 lbs. were Indian, 1,431,931 lbs Ceylon, 31,493,125 lb. China, and 1,417,592 lb. other countries.

Stock of Tea (of all kinds) in Bonded Warehouses at the close of the past five years:—

1890. lbs.	1889. lbs.	1888. lbs.	1887. lbs.	1886. lbs.
103,229,153	109,907,332	110,805,783	113,027,688	109,678,467

THE REPORTS FROM DELI, the tobacco country on the north-east coast of Sumatra, are still very favourable for the tobacco cultivation, and it is expected that the present crop will be the largest one ever harvested in Deli.—*Colonies and India.*

NEW STEAM FUEL FOR LOCOMOTIVES.—It is stated that a substitute for coal in the raising of steam purposes is now being successfully carried out on one of the leading lines of railway, and that two eminent London engineers have patented a system by which a ton of residual oil costing £3 10s may be made to create 8,000-horse power for a space of one hour, and generally to do twenty times the work of coal. It is also stated that the experiments made by the Great Eastern Railway have turned out most successful, and that Mr. Holden, the locomotive superintendent of the line, has patented an injector in connection with the fluid, and that it is now being used on about a dozen locomotive engines as an auxiliary to coal. The fluid, it is stated, is tar, to which is added some green oil from tar works, and the cost is three half-pence per gallon. Each engine uses about 12lb. of coal and one gallon, or 11 lb. of fluid fuel per train mile, as against 34 lb. of coal. The relative cost, it appears, is rather less than coal at the present price of both, but the value of the injector, it is asserted, is seen especially on gradients, when steam can be got up instantly by touching a tap at the hand of the driver.—*Railway News.* [All this ought to be good news for many Ceylon tea planters looking to the future, —ED. *T. A.*]

LIBERIAN COFFEE in and in the neighbourhood of Colombo is all out in a splendid blossom at present, the beauty and fragrance of which are very attractive to bipeds as well as bees. Many of the trees are at the same time, laden with fruit in all stages from green to dark purple as well as with the snowy white blossom. If the native villagers took to cultivating this tree as they do coconuts, they certainly should never be at a loss for a supply of coffee for their own needs.

A REMEDY FOR MALARIA.—Mr. G. Yeates Hunter, late Brigade Surgeon of the Bombay Army, writing to the *Financial News,* says:—"There would seem to me to be little cause for surprise at the reduction in the price of quinine, when it is borne in mind that the Indian kreat is now generally admitted to be, in many respects, superior to quinine. To my knowledge halviva—a preparation of kreat—answers admirably in controlling fever, and also in repairing the mischief wrought by quinine in that large number of patients who suffer from its ill-effects, evidenced by head symptoms, general malaise, intense irritability, &c. After more than 20 years' experience in India of the comparative value of quinine and kreat, I believe that the latter will be more and more recognised by the medical profession as the safest and best remedy against malaria.—*Pioneer.*

THE SEASONS FOR FELLING TREES FOR TIMBER AND FIREWOOD are thus indicated in the *Indian Forester*:—

On the season in which trees are felled depend the technical properties of the wood, and even the possibility of carrying out the work, for labour may not be available in sufficient quantity and at reasonable cost throughout the year, and malaria or heavy rain or snow may be a bar to all operations.

To prevent cracks timber should be allowed to season slowly. Hence it should be felled in damp and cool (if possible, even cold) weather. Where there is a true winter, felling in winter also preserves the wood from fermentation of the sap, from infection by fungus spores, and from the attacks of insects. With regard to durability alone, the theoretically best time for felling occurs when the trees contain their minimum of reserve materials that is to say, generally just after the new flush of leaves is out. But this season can be observed only when it does not coincide with the appearance of new seedlings, which the felling and export operations are bound to destroy; or with the season of heavy rains, during which the ground would be soft and muddy and the advance growth, if there is any, full of tender and easily-injured shoots. It may of course be observed in coupes that are to be clear-felled and then re-stocked artificially. For the safety of young growth the best time for felling is the season of repose, when the plants are least fragile and possess their greatest recuperative power; but on the higher ranges of the Himalayas the snow lies too heavy for felling to take place then without risk to human life, and, as export must take place during the following summer, most of the trees have to be cut in spring, while the seedlings are only just sprouting or coming up from seed. As regards firewood, we know that the quicker it dries, the better it is; also that it is heavier the more full it is of reserve materials. Hence in felling for firewood, the best time of the year, provided sylvicultural exigencies do not bar it, is when dry, warm weather prevails; and if this coincides with the season of repose, so much the better. The time for felling coppice is limited, by purely sylvicultural considerations, to this season, the only exception being when bark for tanning is the chief produce sought, in which case the felling must be effected during the first three or four weeks of the season of vegetation, unless the trees are barked standing, or this period falls within the rainy season. In the case of charcoal-making the charcoal-burners must have a sufficiently long spell of fairly dry weather in which to complete their work. Cleanings and early thinnings in which the poles are cut as they are selected, must, of course be effected while the forest is in full leaf

THE QUININE RING.—The sequel to the recent efforts of the American quinine manufacturers to establish a quinine combination is given as follows in the last report of Messrs. Schoellkopf, Hartford and MacLagan, of New York:—"There can be no doubt we are in for an era of cheap quinine in the States, for a fierce war of prices is raging here, and is likely to grow worse. The representative of an American factory, having failed signally in his recent attempt to beguile the European makers into some sort of combination or arrangement, persuaded his people to enter on an aggressive course to coerce the recalcitrant German factory (supposed to be the Brunswick) to come to terms. The outcome is anxiously watched, but the fight is expected to be a long one, especially, as it is generally believed here that our manufacturers can supplement their output by using the ammunition of their enemies in the battle without any great loss to themselves. Meanwhile the large Philadelphia maker looks on, and keeps his price up. One good effect this quarrel will have—it will relieve the European market of considerable surplus stock.—*Chemist and Druggist*, March 21.

THE TEA TRADE BETWEEN CHINA AND TIBET.—In "Through Eastern Tibet and Central China," by Mr. Woodville Rockhill, in the *Century* for March, the following occurs:—

The road was covered with long files of heavily loaded porters trudging slowly on to Ta-chien-lu, and in every tea-house their huge loads were placed on benches while the frugal coolies refreshed themselves with a cup of tea or a bowl of bean-curd and a chunk of corn-bread. Most of them were carrying tea from Ya-chou or some neighbouring town, about one hundred and fifty miles away, to be taken later, on yaks or mules, into Tibet. They were of all ages, and I was surprised to see among them not a few women and small children. The packages of tea, each about four feet long, six inches broad, and three to four thick, and weighing from seventeen to twenty-three pounds, are placed horizontally one above the other, the upper ones projecting so as to come over the porter's head. They are held tightly together by coir ropes and little bamboo stakes; straps, also of plaited coir ropes, pass over the porter's shoulders, while a little string fastened to the top of the load helps to balance the huge structure, which it requires more knack than strength to carry, for its weight must bear on all the back and only slightly on the shoulders. In their hands the porters carry a short crutch which they place under the load when they wish to rest without removing it from their backs. The average load is nine packages, or from 190 to 200 pounds, but I passed a number of men carrying seventeen packages, and one had twenty-one. A man, I was told, had a few years ago brought an iron safe weighing four hundred pounds for Mgr. Biet from Ya-chou to Ta-chien-lu in twenty-two days. Old or decrepit people commonly travel along this road borne on the backs of porters. Many of the women porters carried seven packages of tea, nearly two hundred pounds, and children of five and six trudged on behind their parents with one or two. The price paid for this work is twenty tael cents (about twenty-five cents) a package, and it takes about seventeen days to make the trip from Ya-chou. So far as my knowledge goes there are no porters in any other part of the world who carry such weights as these Ya-chou tea-coolies; and, strange as it may appear, they are not very muscular, and over half of them are confirmed opium smokers.

There is an illustration, showing some of these tea carriers with their loads on their backs. The Bhutias of Darjiling are also noted for their carrying powers, taking enormous loads of tea lead and other heavy material on their backs up to Darjiling from the foot of the mountains. There is a story, similar to that related above, of an iron safe being carried up to Darjiling on the back of a Bhutia.

THE PRODUCTS AND MANUFACTURES of the coconut palm are thus noticed in "Notes by the Way" in the *Jamaica Gleaner*:—

The original design of a coconut trophy has been partly carried out by the manager who has arranged the coconuts in their various stages round the base of the tree in the Jamaica court, and shown the coir and the fibre beside it, while ranged round the sides of the interior are useful household articles manufactured from the fibre, the latter being exhibited by a London firm. I recommend my readers to see this instructive exhibit.

CARDAMOMS.—Cardamoms grow wild in the Ceylon jungles, but about fifteen years ago they began to be cultivated in several districts of the island by European planters. The results of the venture turned out unexpectedly profitable, the yield having occasionally been as high as 400 lb. per acre. Until a few years ago cardamoms were propagated only from the rhizomes, or bulbs, but since then it has been shown that they can be successfully grown from seed. Until not very many years ago cardamoms were imported exclusively from the Indian mainland, and a considerable quantity, including some of very fine quality, are still drawn from that country; but since the cultivation has been taken up in Ceylon that island has altogether eclipsed the Indian exports. Indian cardamoms are usually imported in large cases, containing from $1\frac{1}{2}$ to 2 cwt. and the Ceylon variety in boxes usually varying from 40 to 80 lb. in weight. The average crops in Ceylon during the last few years have been about 300,000 lb.—*Chemist and Druggist.*

INJURIOUS INSECTS IN 1890.*—The 14th annual report on the ravages of injurious insects amongst our farm and garden crops, which Miss E. A. Ormerod, the able entomologist to the Royal Agricultural Society, issued last week, is a most satisfactory publication. When *The Times* called attention to the first very small report issued in 1877 the subject of economic entomology was almost unknown, whereas now it is recognized as an integral portion of agricultural teaching at the whole of our leading educational institutions. That all this has been brought about from the initiative work by Miss Ormerod must not only be gratifying to that lady, but should be matter of satisfaction to agriculturists and gardeners. The present pamphlet does not differ in form from those that have preceded it. In all 26 distinct attacks by injurious insects and eelworms are fully described and illustrated. This means—as was stated in the history of "British Agriculture in 1890," which appeared in *The Times* a few weeks ago—that last year was an average one so far as insect damage was concerned. Nearly all our common crop pests were present, but only a few really did any serious damage. There is, therefore, no need to refer to these at length. The chief lessons of the year are as to the use of more effective insecticides, such as "Paris Green." The use of these has been considered somewhat dangerous owing to their poisonous character, but with a fuller knowledge of the strength necessary to destroy attack Miss Ormerod thinks the time has come when they may be safely recommended for more general use. In one case a correspondent reports that he last year sprayed his trees ten times with Paris Green (2oz. to 20 gallons of water) with good effect. Although his fowls had a free run all over the field none were injured. In the use of these poisons, however, it is strongly recommended that farm animals should never be allowed to pasture or feed under trees that are being, or have recently been, so sprayed. The chapter dealing with this subject is very interesting, and may be said to exhaust the subject.—London *Times.*

* "Report of Observations of Injurious Insects and Common Farm Pests during the year 1890, with methods of Prevention and Remedy." Fourteenth report. By Eleanor A. Ormerod, F. R. Met. Soc., &c. London: Simpkin, Marshall, Hamilton, Kent, and Co. (Limited). 1891.

CEYLON UPCOUNTRY PLANTING REPORT.

CEYLON PRODUCTS IN THE MARKETS OF THE WORLD—JAVA VERSUS CEYLON KAPOK IN AUSTRALIA—CEYLON METHOD OF PACKING AND FREIGHTS—RAILWAY RECEIPTS FOR TEA BOXES—A SHORT SINHALESE HARVEST—COFFEE CROPS—FLUSH OF TEA—COOLIES.

April 2nd.

It is not often that a Ceylon product has to take a second place in the markets of the world. We are so much accustomed to a front seat that we have begun to look upon it as a right, and if not awarded, inquire the reason why. It is our pride, more than our pocket that is offended when even one of our minor products runs with the neck, instead of leading as we hold that all Ceylon things should do.

One of those minor products which does no credit to the name of Ceylon is Kapok—the tree cotton. It grows well enough, and ought to do well enough, but in the Australian markets it is a drug and cannot get a buyer, if kapok from Java can be had at the time. Now the Java kapok is, I understand, exactly the same as our own, and the reason why it is readily bought up, at from 8d to 9d a lb., while Ceylon kapok is hard to move even when offered at 5d to 6d is simply a matter of preparation. Java kapok reaches the Australian markets packed in mat bags, thoroughly teased out, and free from seeds, whereas the Ceylon article has been subjected to hydraulic pressure, has been very imperfectly cleaned—not only seeds but even the core remaining, and the cotton often in little lumps.

There is no doubt that by the Ceylon method, of having the cotton heavily pressed, there will be a considerable saving in freight, but upholsterers and especially mattress-makers dislike it. It breaks the spring of the cotton fibre, and a mattress made of the Ceylon kapok is heavy and solid, whereas a Java kapok one is light and elastic. A gentleman who has just come up from the Australian Colonies, and to whom I am indebted for the above information, was most emphatic on the positive dislike which existed among buyers of kapok, to any of it coming from Ceylon. It was simply because freight from Java was not always to be got, and as a consequence the market was sometimes wholly devoid of the Java article that the kapok of Ceylon got an innings at all. Now this is not a hard matter to remedy. To have the kapok wholly free from seeds, or any other impurity, well teased, and looser packed is all that is wanted. What is *not* wanted is what goes down at present, an imperfectly cleaned and slovenly prepared product, and which is rendered less valuable still, in that it arrives pretty nearly as hard as a concrete block and bound with hoop iron.

As I said at the beginning, Ceylon takes unkindly to a back seat in any matter, and as regards kapok—for which there is a good demand in Australia—there is no earthly reason why growers of it here should not get the top price going. The difference in freight would be very much more than met by getting the advance in price, and then the comfort of having an article that would sell.

The Ceylon Government Railway is about as irresponsible as it can possibly make itself, and its regulations and by-laws are the astonishment and envy of the managers of home lines. But the tide still runs in the direction of even greater security and if a motto were wanted for that branch of the Government, the historic one of "I 'll make siccar" might well be adopted. Railway receipts are seldom clean, and if you are despatching tea, let your boxes be what they may, there is some remark about them, testifying to the argus-eyed vigilance of our carrying Company. We are now pretty well accustomed to the "one plank loose" or "some nails coming out," or other matter of this kind and the whole thing ending in nothing. It always reminds me of a mate's receipt I once saw. Bar iron was being shipped, but while the number of bars were right enough, there was the saving clause of "very rusty" written across the document! The other day I got a receipt back from the railway; there were no planks loose this time nor nails coming out, but, two of the tea chests were "stained with cow dung"? Was there ever such perfection as that? This official deserves and I trust will be promoted. Just contrast his precision, with the loose way things are often done on board ship. Three elephants were once shipped at Calcutta, or at least were supposed to be shipped. All the receipt that could be got out of the ship however was for two, with the clause "one in dispute," added. I never heard if the other elephant was found.

The Sinhalese harvest just being reaped, is I hear, a short one in some districts—as much as a third behind last season it is said. If the villagers have not a sufficient rice harvest, if they but come to the tea estates, and work steadily, they will earn a harvest of rupees instead. What tea flushes we have been having, and how pushed all have been to keep up with them! A wonderful season certainly.

Coffee, too, in many places is looking very well; I was hunting the other day for a specimen of leaf-disease and could not find one. There is a fine crop, too, set and a promise of more. But there is the experience of the past of what a fair deceiver coffee is, and while it is legitimate enough to chronicle the present prosperous appearance of things, and rejoice therein, still there is so much between this and the harvest.

The unusual push on estates at this season has made the value of Ramasami rise again, and the recommendation of the Planters' Association in the matter of advances is pretty much disregarded. Those who have fairly and honourably tried to act on the suggestion have found their labour force falling off and have had to do the next best thing, join in the scramble.

This is very much to be regretted, but it was not wholly unforeseen. Every year makes the need of coolies more and more evident, and yet it is wonderful how we manage to scrape through. The Tamil nation met our wants when there was the big run on coffee, although there was many a fearful Jeremiah with his roll of the coming woe, who foresaw nothing but disaster, and I have no doubt that history will repeat itself, and with our increasing outturn of tea there will come an increasing influx of Tamil labourers to meet our wants. Any how it would make one uncomfortable to believe otherwise. PEPERCORN.

A SUBSTITUTE FOR COAL: THE FIRST LIQUID-FUEL EXPRESS LOCOMOTIVE IN THE WORLD.

[We are indebted to a correspondent who writes:—"I send you copy of the *Daily Graphic* with the account of a run on a Liquid-Fuel Express Train. As the matter bears on estate firing, I thought you would like to see same."—We give nearly all the report as of special interest to planters and others who may be longing for an economical fuel.—ED. *T. A.*]

A RUN ON A LIQUID FUEL EXPRESS.

(BY OUR SPECIAL COMMISSIONER.)

It was the box-seat that did it. Had we something corresponding to the box-seat on our fast engines, where for an extra fee, one could face the wind and the rain, the sunshine and the mist,

we would discover that trains are no less interesting and picturesque than ever the old lumbering dead and gone stage coaches were; for there is beauty in an engine—leaving on one side the smoking, puffing, evil-breathed metropolitan or suburban engines—the beauty of strength and speed. Had not Dickens and Hazlitt and other literary giants of that day told us in their best of the joys of the ride on the stage coach, and hid from us its many discomforts, we would have seen less of romance in it than we do now.

ENGINE 759.

At any rate, I found much to admire in Engine 759 as she ran up the line at Ipswich station, coming to a stand after her steam from Yarmouth. She is practically the only express engine fed by liquid fuel. There are other liquid fuel engines, many in Russia, a few in the United States, and in South America, but none are entitled to be called "express" engines, engines which do long runs at a high speed. Engine 759 is now some eighteen months old, and she is in the pink of condition. She differs from the ordinary engine in appearance by having on the tender, in stead of some tons of coal, an iron tank, and in her cab one to the manner educated would have noticed a few more taps and handles and levers than usual.

A REFUSE OF VALUE.

I had travelled down with two officials of the Great Eastern Railway Locomotive Department at Stratford, and was told of one of those mechanical revolutions, of which this century has seen so many. The story is a curious one. The railway company have at Stratford gas works where they make from shale oil the gas which is burned in their trains. In the making of this gas refuse in the form of thin tar is given off, and this having been run into some stream at Stratford, the authorities came down on the company for river pollution. That it was possible to further pollute any stream at Stratford was a surprise to me. However, the company had to get rid of their refuse in some way, and it occurred to Mr. James Holden, the Locomotive Superintendent, that the best he could do with it was to burn it. He hit on a plan of burning it under the stationary boilers used for making the gas, and suddenly, from a mere refuse, this by-product had become valuable. Little led to much. Mr. Holden went on to invent a system by which the refuse could be used as fuel on locomotives, and at once effected a revolution in the fueling of engines.

SOLID AND LIQUID FUEL.

There were great difficulties to be got over. In this country it would be of little use designing a system which would render engines useless for solid fuel, or one such a nature that the parts are complicated and easily thrown out of action. It has, further, to be under the ready control of the driver. Another and chief difficulty is the blast. All these points have been fairly met. Dealing with the blast first, I must explain that when burning liquid fuel the blast required is much softer than when burning coal alone. A greater quantity of air must pass through the body of the fire when coal is used. Means were found to enlarge and reduce the blast pipe, and thus fit the engine for either coal or liquid fuel. Accompanying this is a sketch of the engine, with the front removed to show the blast pipe. The diameter there shown is 6in., and it is that diameter which is "on" when the liquid is being burned; but when coal alone is being used, the fireman touches a lever, the ring above comes down, and, being conical, reduces the blast pipe to 5in. diameter. When the large diameter is in use there is less wear and tear of fire-box and tubes, and less back pressure on the cylinders, and the engine in consequence works more freely. It will be seen that this arrangement of enlarging the blast pipe, which has been invented in connection with this system, is of high value.

HOW THE FIRE IS FED.

To explain thoroughly the ingenious arrangement of Mr. Holden's apparatus would require much technical detail. How it is done is simply this:—The liquid fuel is conducted from the tank through pipes to the "injectors." These (two in number) are placed below the footboard in front of openings provided in the fire-box. Coming from the boiler are steam pipes, all easily regulated by the bunch of handles shown in the sketch. The steam passes through these pipes to the injectors, there meeting the oil and driving the atomized fuel into the fire-box. But before combustion takes place the stream of pulverised liquid is met by still another gush of steam known as the ring jet, which induces a strong current of air, and the fuel is thrown into the fire as a fine spray, charged too with abundant oxygen for rapid combustion. Then there are other cunning contrivances—a lever which regulates or stops the flow of fuel to the furnace, a handle which, turned, sends a jet of steam through a coil in the tank to warm it in cold weather or liquefy it when it is thick, and various other matters, all tending to great economy in working and in fuel. As to the relative value of the system with that of solid fuel, that also is important. One pound of the fuel is equal to 2 lb. of coal, which means that, as with a pound of coal 8lb. of water can be evaporated, a pound of liquid fuel will evaporate 16lb. of water. The fuel costs 25s a ton; coal to do the same work (two tons) costs 35s—a big saving alone. Of ten engines of the same class, one using liquid fuel requires per engine-mile (which includes standing in sheds, sidings, &c.), 11lb. liquid and 12 lb. solid fuel. The others require 34lb. solid fuel per engine-mile. The weight on the tender is reduced by a couple of tons, and the saving all round is something like 50 per cent. The gentleman who has had this department of the Stratford Works in hand form the first, tells me that the fuel used to cost them ¾d a gallon. They are now paying 1d a gallon for it. They add to it a refuse oil obtained from the Backton Gas Works, a creosote or green oil left over after tar distillation, which costs from 1½d to 2d a gallon, and brings up the cost of the fuel to about three halfpence per gallon.

THE START.

But all this time Engine 759 has been standing waiting the signal to be gone. Here is her official description:—Driving wheels, four coupled, 7ft. diameter; cylinders, 18in. by 24in., weight, in working order, 40 tons. Our times were:—Ipswich 4.22; Liverpool Street, 6 o'clock—nearly seventy miles to be done in an hour and twenty-eight minutes. A few yards away rose the tree-clothed hill, crowned with a pretty red-brick house, which serves to make Ipswich Station one of the most striking in the Eastern Counties. Even the tunnel, with which it has been pierced, hardly disfigured it, and on such a day—sunshiny, warm, and blue skied—after a spell of London fog it was enough to suggest the still far-off spring. I climbed into the cab of Engine 759, and saw the fuel pipes at rest. The fire was a dull glow, for it is one of the benefits arising from the use of liquid fuel that none of it is wasted when the engine is

at a standstill, and no steam generated only to be blown away in a shrieking howl from the safety valve. Driver Dennison was oiling the human machine which is his, as he turned to welcome us aboard. Bob, the fireman, was oiling Engine 759, and we had the engine to ourselves for a moment. Its weight saved it. But time was now up. The "board" fell, somewhere in the rear of the train the guard whistled, and with a sharp toot and then a long call from the whistle, we were on our way up the tunnel. Bob had pulled the fuel lever and touched the steam cocks, and as he threw in three or four shovelsful of coals, showed us the fire-box suddenly become a raging furnace of white flame. Yet as we came into the daylight the smoke stack gave no sign of smoke. A long line of steam trailed behind us, and it was pointed out that even when she was being coaled no smoke came from the engine funnel. Here is the smoke nuisance solved, so far as railways are concerned, thought I. We had now settled down for the run. We were going up hill—something like one in 110, I believe—and the load, seventeen coaches, was a heavy one. Another coach and we would have had to come on with a pilot, as is the case with this train all the summer months.

* * *

AT TOP SPEED.

A little steam was blowing off and we seemed to whistle under archways and station roofs in our speed. Away as far as I could see as I leaned out of the cab, were a number of platelayers, their day's work done, going home. They were on the up line, and when there was still a long distance between us and them the driver pulled the whistle cord. They stepped aside with pleasing promptness, and almost at once I caught a glimpse of their brown upturned faces as we powdered past. "We did that bit at over sixty," said my mentor. Only "Surfaceman" could sing the praises of such an exhilarating whirl of life inspiring haste as that! Yet one had time for contrasts. In the height of our fastest pace a country church with its white headstones, each with its wreaths and flowers of remembrance, was for a moment in sight. Who could have failed to think that for all our rattle and rush and roar, for all our "ever toiling up the climbing wave," there was the terminus? Still even there it may be pleasant to think we have been one of the first to do seventy miles in an hour and a-half on a liquid fuel express. We were nearing the end. A murky haze ahead and the lessening of the distance between the stations betokened an approach to London, whose lights were now beginning to show. Away down in the country there was an impression of stillness. The stations, the roads, the fields looked quiet. We were the only noisy object in sight. Even the woodman as we passed stopped his chopping to gaze at us in the still of the evening air.

ALMOST HOME.

Now people appeared thickly on the stations. The roads had become streets, and were brisk with traffic. We went by suburban trains laden with folk. London was around us. We had had a clear run. Only once did a signal stand out against us, and at once the fuel was shut off and the train began to slow. But it was only for a moment. Even in the crowded ways about the suburbs our course was indicated by green lights, and only outside Liverpool Street itself did the red show. We came to a full stop, shut off steam and fuel, and waited. The effect of shutting off the fuel was wonderful, reducing the fire at once to merely a bright glow. "She's down," said Bob, as the signal dropped and we glided into Liverpool Street ahead of time, with the black of the fire bars showing in the box—enginemen will appreciate that after an express run—and no steam being wasted at the valve. It only remains for me to add that the system has already begun to affect the coal supply. Mr. Holden's agents, Taite and Carlton, are fitting it up on South American engines, and there it means all difference between very cheap liquid fuel at their own doors and English coal imported at £3 per ton.—*Daily Graphic*, March 4th.

THE ANCIENT CINNAMON REGION.

At the meeting of the Royal Geographical Society on Monday last, an interesting paper was read by Dr. H. Schlichter, on "Ptolemy's Topography of Eastern Equatorial Africa." The object of the author was to show that Claudius Ptolemy, one of the most famous of ancient geographers, who flourished at Alexandria about 150 B.C., knew and mapped out the position not only of the coast of Africa as far, and even farther, south as Zanzibar, but also, with tolerable accuracy, indicated the position of the great lakes of Eastern Equatorial Africa. In how far Ptolemy's topography was correct need not now be inquired into; but, in the course of the discussion it was pointed out that Ptolemy placed the "cinnamon country" of the ancients (*Regio cinnamonifera*) to the south-east of the Victoria Nyanza, whereas the country known to the ancients as the myrrh and cinnamon region was placed by them along the south coast of the Gulf of Aden, and the littoral south of Cape Guardafui. In connection with this statement it may be pointed out that there is evidence for the assumption that the cinnamon known to the ancients was the Chinese cassia; while it is practically certain that long after Ceylon was visited by European trading-vessels no cinnamon was produced in that island. The question whether in classic times cinnamon, or cassia, really did grow in Eastern Africa has frequently occupied the attention of pharmacologists; but the balance of opinion appears to incline to the belief that the cassia of China, along with other products of the far East, were carried to the ports on the Read Sea and the north-east coast of Africa by Indian traders, and there taken possession of by the Phœnicians (and after the decay of Tyre by the Egyptians), who carried them further towards Alexandria and other Mediterranean ports, but were, of course, careful not to divulge the trade secret of the origin of the valuable spice. In modern times neither cinnamon nor cassia has been produced anywhere in Africa on a commercial scale.—*Chemist and Druggist.*

[And yet, cinnamon is almost the only product left to us to which we thought we could safely apply the term "indigenous": we have the wild cinnamon tree in our jungles. We shall want to hear what Dr. Trimen has to say in answer to Dr. Schlichter.—ED. *T. A.*]

OPALS of a finer quality than those of Mexico have been discovered near Moscow, in the State of Washington, U. S., close to the Idaho Railway. They were found by some labourers while digging a well in a wheat field, the mother rock being a basalt wacke. Opal is an amorphous hydrated silica, and is deposited from water. The finest specimens of the gem or precious opal come from Hungary, but those of Mexico are very fine. The fire opal of Zimapau, in Mexico, is transparent and of a deep red, being coloured by oxide of iron. Small veins of opal have been found in several parts of the United States.—*Globe.*

THE JAMAICA EXHIBITION: WHY NOT A COSMOPOLITAN EXHIBITION IN CEYLON?

PRODUCTS OF JAMAICA.

From a description of the Jamaica Court, some interesting extracts must be taken:—

In the centre of the Court as already stated shoots up a palm tree whose spreading branches arch overhead and add to the picturesque effect of the building. At the base of this tree are two tropical plants in tubs, one is the pepper plant the other is a fine specimen of the pine apple—*ananassa Sativa.* At the four corners of the Court are bananas in tubs, coffee plants in berry, palms, crotons, large barrels of raw coffee berries and a small barrel of cocoa berries. Barrels of sugar are placed at the other corners.

COFFEE.—The specimens of coffee are arranged on shelves, on the east side of the court on the exterior. They are the first objects one sees on entering the hall and looking to the west: The different coffee parishes are well represented. In the centre is a fine exhibit sent by Capt. G. G. Taylor, from his Moy Hall Estate in the Blue Mountains. This coffee is grown at an elevation above 4,000 feet and competent judges state that some of the samples here shown are equal to the finest coffee produced any where. In connection with this exhibit we may mention that Capt. Taylor exhibits in the same court a painting of his Coffee Plantation works, and also one of his Coffee Fields at Moy Hall. These are very characteristic views, giving one a true idea of what mountain scenery in Jamaica is. There are also fine samples from Whitefield Hall, Cold Spring (John McLean), and from the various parishes. From St. Catherine for instance there are samples from the estate of Mr. Thomas Kemp, Mr. Thorp, &c. From Manchester from Mr. Wyman, Mr. Elder and Mrs. Martin. St. Andrew from Messrs. Henderson, McClaverty and Thorp. Clarendon from Messrs. Young, Welsh, Waddell and Logan. St. Mary from Mr. Walker, and a specimen of Liberian coffee from Mr. Jenoure, Portland.

RICE &c.—In the corresponding division on the opposite side are exhibits of pimento, nutmegs, and cinnamon. There is also an interesting exhibit of rice from Dr. Calder's fields in Westmoreland, and one from Portland, sent by Mr. Thomas Briscoe.

COCOA AND KOLA.—On the eastern shelves is arranged a pretty exhibit of cocoa. The seeds are contained in bottles on either side and in the centre are a lot of fine pods, mixed with specimens of the prepared cocoa from different exhibitors. Specimens of Kola beans are also shown with the powder.

Tea seems to have been exhibited only by the Botanical Department. The negroes of Jamaica, although more advanced than those of Hayti, have not, it appears, yet abandoned their savage and degrading superstition of the Obeah; as the following paragraph shows:—

The article in the "Victoria Quarterly" on Obeahism by Inspector Thomas is one of the most scathing that has ever appeared in that generally very mild journal. Inspector Thomas has had exceptional opportunities for studying the superstition and what comes from his pen is sure to be trustworthy. The picture he draws of the degrading belief is a sad and disgraceful one, and it is in the hope that his article will assist in stamping it out that the Inspector has penned it. It will be published in pamphlet form and sold at the Exhibition, where the Inspector has also an exhibit of some of the articles taken from the practisers of the vile art.

The Christian Church as presented in its state-supported form could not, in days of slavery, ave been instrumental in superseding such superstitions by a purer faith, as witness the utterances of a candid clergyman regarding the now happily disestablished Church of England:—

Churchmen are not the only men who will wish to have the book. Nonconformist will buy it, read it, and learn from it. And they will be pleased to find that they have in the writer of the sketch of the history of the Church of England in Jamaica one who writes without fear, favour or affection out of place. The exclusive spirit that wounds, because it ignores the Christian work of other people, Mr. Ellis does not cherish. If he does, it is not in his book. There is the ring of honesty in what he says of this other work, and it occurs again and again, so that the acknowledgment is full. On the other hand Mr. Ellis touches frankly on the shortcomings and the blots on the early Church of England in Jamaica. He is as plainspoken on these, as on the good work done by the Nonconformist missionaries. In this way and following the thread of his narrative, the reader gets a very fair outline of the history of Christian progress in Jamaica, and he learns that that progress is real, and better still is assured.

Mr. Ellis gives his readers some curious glimpses of the clergy in the olden times. One of his mildest censures is the following:—"Nor, as we shall presently see, were the character and attainments of some of the clergy, licensed by Bishops of London, calculated to give the laity of Jamaica much confidence in the tact and judgment of the prelates who selected these clergy and licensed them for their sacred duties." In the early part of the 18th century the Jamaica Church was, he says, "regarded as little more than a respectable and ornamental adjunct of the State, the survival of a harmless home institution, which would cease to be tolerated if it showed any great signs of energy or activity. At best it represented the religion of the white settlers, and cannot claim in any real sense to have been a missionary church to the black labourers * * * few traces are to be found of any marked efforts on the part of the church to raise the moral tone of the slaves, to ameliorate their distressful position or to instruct them in the elements of religious truth." Referring to the circumstances that must have hemmed in any clergyman disposed to be active, Mr. Ellis observes, "As subsequent events prove, and as no doubt the planters anticipated, the inculcation of Christian truths should not fail to produce feeling of disaffection, and a consciousness of humiliation and ill-treatment in the minds of the African bondsmen. 'The truth shall make you free,' and those who were opposed to freedom were at any rate consistent in withholding the truth. It is easier to find fault than it is to make allowance, and if the Jamaica clergy of the eighteenth century deserve their share of blame, they are at least entitled to a large and charitable allowance in view of the difficult and unusual circumstances under which they laboured." A contemporary writer is quoted as saying of the clergy of that time that the majority of them were "of a character so vile that I do not care to mention it; for, except a few, they are generally the most finished of debauchees." Mr. Ellis then remarks, "The same writer adds that many of the churches were seldom opened, a fact which only a sham sentiment can regret. There is a sort of pleasure in giving these disreputable clergy credit for the possession of that amount of grace and of good feeling which was sufficient to prompt them to keep their shameless persons outside the doors of the houses of God."

Some startling information is given in reference to the administration of the Sacraments of the church. "As an instance," says Mr. Ellis, "of how little care the legislature took in the religious condition of the slaves at this time, we may mention that the fee, fixed by law, for administering the Sacrament of Holy Baptism to a slave was £1 3s 9d, a sum large enough to be prohibitory." Even in this century things were in a strange condition. In 1816 when Mr. Monk Lewis was on a visit to the island to look after his properties, the following incident occurred. "One day during this visit a slave wished one of his children to be baptised, and, as there was no clergyman within many miles, Mr. Lewis undertook to administer the Sacrament. The ceremony took place in the dining room, Mr. Lewis signing the child's forehead with the sign of the cross, and offering an *ex tempore* prayer. This was followed by the baptismal party giving three

cheers for Mr. Lewis, who concluded the ceremony by distributing Madeira among the congregation." In the same year the baptismal fee for a slave was fixed by statute at two shillings and six pence. Between 1821 and 1824 one clergyman baptized 12,000 slaves at half-a-crown a head.

Dr. Wolcot (Peter Pindar) was, for a time, one of the exemplary clergy referred to. Some of the *Observer* readers may be as ignorant as we were until we read the literature of the Jamaica Exhibition, that, amongst Queen Victoria's titles, in addition to Empress of India is "Supreme Lady of Jamaica." We notice that the working of the railway by the American company to which it was so unwisely sold by Government is described as most unsatisfactory. A fatal accident is reported in the paper before us. Amongst the distinguished personages present at the landing of Prince George was Major Knollys, C. M. G., Inspector-General of Police, who came to Ceylon as Sir Arthur Gordon's A. D. C. The report states that

The photo-artist of "Harper's Magazine", the "Illustrated American" and "Frank Leslie's Newspaper" was busy during the interval of waiting taking photographs with the camera.

If we quote a notice of the opening ceremony at the tail-end of this communication, it is due to the arrangement of the matter in the three sheets of the special edition of the *Gleaner*. From its report we learn that

The ceremony which took place in the Exhibition Building was certainly one of the prettiest from a spectacular point of view that has ever been performed in our island. For never before has such a handsome building graced our town and seldom has such a galaxy of distinguished men and women been gathered together on so interesting and important an occasion is this when our first International Exhibition was opened by His Royal Highness Prince George of Wales. Truly our Royal visitor received a welcome worthy of the grandson of the Queen—a welcome which every one could see was the source of deep gratification to him.

His Royal Highness then stood in the centre of the dais, the Governor on his right and Lady Blake on his left, the Vice-Admiral Watson being next to her. Lady Blake was attired in a dress made in an English School of Art and designed by a Baronets. It was trimmed with Orchids and leaves embossed on light Canary Satin with Chaneille trimming, each end of which alternated with balls of Canary and Heliotrope. Her Bonnet, was of light canary velvet with Heliotrope Orchids and aigrette.

From the address by the Commissioners to Prince George, we take a few paragraphs :—

The original suggestion from which this Exhibition took its rise was, by collecting and displaying samples of the Agricultural Industrial and Commercial products of the Island, to arouse and foster a spirit of enterprise and emulation among the inhabitants of Jamaica, and at the same time to disseminate among the people of other countries a more extensive knowledge of the resources and capabilities of the colony.

The spontaneous and liberal manner in which funds for carrying out the enterprise were guaranteed by the people of the colony and those interested in its welfare and the ready response with which the invitation to take part in the Exhibition was met by the Mother Country, and the sister colonies—notably by Canada—and by many Foreign states led to the enlargement of the original scheme and has resulted in an Exhibition on a larger scale, and of a more general and comprehensive character than that at first contemplated by its originators.

Every effort has been made to render the Jamaican Exhibits a complete and representative collection of the agricultural, mineral and industrial products of the Island and we would venture respectfully to express a hope that, as such, they will be found by Your Royal Highness to possess features of novelty and interest.

The Prince made a suitable reply ; and after a prayer by the Bishop, during which a canary poured out its song, and after Sir Henry Blake had presented a golden key to the Prince as a fitting emblem of a golden future for Jamaica, Prince George declared the Exhibition open. The address from the city was enclosed in a casket made from 120 ounces of silver. When we left Britain for Ceylon in August 1837, there were not more than 200 miles of railway completed, and the first experiments in telegraph were being conducted by Wheatstone. Deeply interesting is the progress of telegraphy in the interval, as narrated in connection with exhibits of the appliances of the art :—

Of Historical Telegraph Apparatus there are Cooke and Wheatstone's 4 needle Telegraph 1838, Cooke and Wheatstone's Double Needle Telegraph 1844, First Train Signalling Instrument 1840 used on the Blackwall Railway between Limehouse and Stepney. Specimen first Telegraph Line 1837 between Euston and Camden Town. Double needle small pattern, Highton's single needle Telegraph 1848 Wheatstone's Type Printer 1841. Varley's Horizontal Relay 1856. Wheekey 1855 ; set of wire joints 1842. to 1851 Switch or commutator 1857. Preece's Semapore 1860. Bain's Chemical Telegraph 1850. More Embosser 1853, Universal Switch 1860. Specimen of first submarine cable Dover and Calais 1850.

Mr. Wilson informed us that this cable was of solid copper wire insulated with Gutta Percha there being no outer protection whatever, the consequences were that the Gutta Percha almostly immediately chafed through and the undertaking failed. To make the cable sink to the bottom weights were attached during the laying at about every 100 yards.

In 1851 another effort was made to carry the Telegraph Line across the Channel, which was successful. This cable is now working, that is to say portions of it, for in the many repairs it has been subject to fresh cable has been put in, to replace the old.

Mr. Wilson also informed us there is today over 100,000 miles of Submarine Telegraph Cables in operation. The general portion is owned by English companies, and all are manufactured and laid by English firms.

Mr. Wilson said, to give some idea of the employment of labour throughout the world brought about by the varied applications of electricity the following is about the number of persons employed. Land Telegraphs, 180,000 persons. Telephone Companies 30,000 persons. Electric Lightning Companies 100,000 persons. Submarine Cable Manufacture (Mainly British) 5,000 persons. Submarine Cable Company (Mainly British) 6,000.

Mr. Wilson informed us that at the present day the Telegraph systems throughout the world possess about 1,800,000 miles of wire. Russia claims 154,000, France 170,000, Germany 180,000, the United Kingdom 240,000. India and Colonies 200,000 and the United States 600,000. Traffic carried over such Lines—United States 70,000,000 messages per annum, United Kingdom 45,000,000, Colonies and India 12,000,000, France and her Colonies 32,000,000, Germany 18,000,000.

Mr. Wilson told us all Englishmen should be proud that the first specification of patent taken out in any country for telegraph apparatus was granted to Cooke and Wheatstone in 1837.

It was not till 1845 that public interest was really attracted towards the Telegraph—Fame and success are frequently due to a mere accident and this was the case with the Telegraph. A murder was committed at Slough and the murderer escaped by the first train to London. The telegraph was set to work and the carriage occupied by Fawell—that was the man's name—was arrested much to his surprise he not having taken into calculation the new element which had been used against him.

We fear we have extracted too freely, but we think the interest of the matter will more than atone for its

length, especially to readers who favour the idea that Ceylon, no less than Jamaica, ought to have an Exhibition of her own: not merely a collection of local exhibits, but a cosmopolitan and comparative show to which all the countries in the world should be invited to contribute. If such an Exhibition is deemed feasible, and if it is to precede the great World Show at Chicago, there is clearly no time to be lost in making the necessary preparations and arrangements. Money will be required, and may we suggest that to no better or more reproductive object could the proceeds of the pearl fishery now in progress be devoted? The responsibility of cordially accepting or coldly rejecting the idea rests with Sir Arthur Havelock.

BURNT EARTH.

This material is very useful to the cultivator who has a cold or stiff soil to deal with, as it promotes the drainage, and is especially useful where liquid manure is applied, the noxious substances inimical to plant life being eliminated, and the soil made much warmer and richer in potash, lime, phosphoric acid, carbon, &c., ingredients which increase greatly the fertility of the land. Burnt earth dressing will prevent the cracking of the surface during dry weather by rendering it less adhesive, and therefore not so liable to cake. We use a large quantity of it here for mixing in the Vine and Peach borders, for Roses, &c., under glass, and outside for herbaceous plants, and it is found to be useful for all of these; in fact, I have not the least doubt that it would prove beneficial to all kinds of plants here, and also wherever the soil is stiff and cold. If used in the proportion of one part burnt earth to six parts soil, and well mixed, it makes a great difference at once in the working of the latter, and is, in fact, the best thing that can be applied for the pupose; other materials that are often used for keeping soils open, such as sand, coal-ashes, lime rubbish, &c., do not give such good results, because they tend to impoverish instead of enriching the soil. A good instance of its utility is to be seen here at the present time; the borders are being renewed in our large Peach-house, because they were not properly made when the house was built, and some four years ago I had a quantity of burnt earth worked in amongst the roots of the trees on the coldest side of the house. These trees now lift with a nice lot of fibrous roots; the soil comes away cleanly, and in good condition. The soil of the opposite border, which has not been treated in the same manner, has become sour in many places, and the tree-roots have not many fibrous roots.

I have not had the opportunity of trying its effects on light soils, but imagine that it would benefit them also if used in a smaller quantity; it would certainly improve any that might be overcharged with nitrogen through excessive manuring, &c., and during dry weather it acts as a reservoir for moisture when placed beneath the surface.

The best time of year for preparing it is during a spell of warm, dry weather, everything burning freely when dry, and earth being no exception to the rule; but it is possible to burn it under any circumstances by using a larger quantity of fuel.

In this, as in all other operations, very much depends upon getting a good start. We generally get some large tree-roots, or "butts," which have been sawn off, or some large logs cut into lengths of 3 to 4 feet, and a small quantity of sticks and straw to get a good body of fire as quickly as possible. The small stuff soon burns out, but when the larger pieces get well alight, some bush prunings, &c., are thrown on it in order to keep the soil from settling down too close to the large logs, and as soon as the fire burns partly through this covering, some soil may be put on. This should be done gradually at first, so as not to overload the fire; but when all the heap has had one good covering of soil, and the fire is seen to be making its way through it, some coal-dust should be scattered all over, and another lot of soil put on; after this is burnt through, the heap should be ready to "draw" by opening out the middle, so as to spread the fire, and get a good base of ashes. This is best done by what is called a "muck drag" in this part—an iron tool with two or three prongs about 9 inches long, shaped like a Canterbury hoe; after the fire is well open out, another old log should be put in the centre to keep a body of fire going on, some more garden refuse placed over this, and then more soil added.

The heap by this time should be a large one, and in dry weather will burn almost anything with little further assistance; but if the soil is wet and the weather rainy, some coal dust or old pieces of timber should be added occasionally so as to keep the fire well alight. The best soil for burning is a rather light loam from a pasture, cut in turves about 4 inches thick, but this is not easily obtained by many persons, and the best that can be had must therefore suffice; clayey soils will not do, as they burn too lumpy and require screening afterwards, and very sandy soils would most likely run down too fine to be of much benefit; old fruit borders that have got sour or worn out will answer well for burning, and refuse from the potting benches, if free from crocks, prunings of fruit trees, &c., make first-rate ashes if burned up in this manner, but this is properly speaking charred refuse, and does not come under the heading of burnt earth.—W. H. DIVERS, Ketton Hall, Stamford.—*Gardeners' Chronicle.*

COCONUTS AND CINNAMON.

VEYANGODA, 28th February.

With very nearly 4¼ inches of rain February, one of our driest months, all anxiety with regard to the effects of the drought is at an end. Under ordinary circumstances, the drought will practically be at an end in March, for in April we have the fitful showers which are associated with that month. A heavy fall of 2·53 inches on the night of the 12th instant was particularly welcome to all forms of vegetation, and to cattle. The latter have not, as is usual at this time of the year, suffered from want of pasturage.

The prospects of coconuts are bright for the year. The effects of three consecutive years of liberal rainfall are now apparent in good crops. Prices both for the raw nuts and for copra are good. The former is kept up by the demands of the local Desiccating Factory, where prices ranging from R34·50 to R35·50 are paid according to quality of nuts. There seems to be no end to the extension of the works here. Buildings seem to be cropping up all over the grounds to supply the orders that pour in from all quarters of the globe.

The cinnamon season 1890-91, that will end in March, will be long remembered as one of the most unfavourable on record. Both the S. W. and N. E. seasons were unfavourable for continuous peeling. Harvesting was carried on by fits and starts, whenever rain fell. With any other product, one would have been safe to predict a diminution of crop as a result of unfavorable seasons. This is impossible with cinnamon, the output of which mysteriously increases when circumstances point to a decrease. It is safe, however, to say that the vast majority of cultivated Estates in the principal Cinnamon districts of the Western Province have secured little more than an half of their annual crops. With the rain we had this month many Estates have resumed peeling. The possibilities of continuing the work are dependent on the weather, which, if appearances are to be relied on, will prove favourable. Last night we had all the indications of an imminent shower in low rumbling thunder and flashes of lightning, which seemed nearer and nearer as the night wore on. They ended in nothing, however, here, but may I think be safely regarded as a precursor of what we may expect in a day or two. With a diminished crop, the contemplation of lower prices at the last sales is not over pleasant to proprietors. The hopes ex-

pressed of a rise in prices "next time" are the usual buoys that keep those engaged in agricultural pursuits from despondency.

The necessity of supplying certain demands often threatens an industry. The suicidal inclination to meet them is fostered by high prices. The encouraging prices paid for fine Tea stimulate fine picking, in spite of its having been shewn by a competent chemist that it is a great strain on the bushes. Not only the prices realised, but the reputation an Estate and its Manager acquire, promotes a pernicious practice. The reference to Tea is only to exemplify what is being done with another product with which I am more immediately concerned. Those who are in a position to compare cinnamon estates as they were 20, or even 15, years ago with their present condition, cannot fail to be impressed with the evils of fine cutting. It is not to be supposed, however, that the difference in appearance is mainly due to the difference in the height of the bushes. No, the growth is decidedly weaker now than then. The bushes are less healthy. Those whose accounts of crop cover the period I have named will, I am sure, find, on reference to them, that the difference in quantity will range from 20 to 40 % between then and now. The mischief is that the decline has been so gradual as to be hardly perceptible. For 2 or 3 years the yield is kept at the old average by forced cuttings. Then the inevitable, that crop has decreased, is faced, and a lower figure is accepted as the annual yield. It is attempted to keep up to this lower figure by a system of forced cuttings for a few years, with a like experience—a lowering of the estimate of yield in a few years—till now, as I said before, the difference in yield, though imperceptibly, has declined materially. The growth of wood, as before stated, is not as healthy now as it was before. The sticks are stunted. This, however, is not to be wondered at, and is the natural result of shoots from immature stools. Where I wonder is this system of fine cutting to end? I see no end to it, however, as long as the demand for fine cinnamon lasts. The manufacture of cinnamon is becoming a fine art. The older generation of peelers is quite out of it, and the "quilling" is entirely in the hands of young men and boys. The improvement in the make of the quills will be best understood when one circumstance is mentioned. About a dozen years ago, and after the craze for manufacturing fine quills had set in, a Manager of a crack Estate drew special attention to a parcel of exceptionally fine cinnamon of "superiors" which averaged 19 quills to the lb. Now 40 quills to the lb of the same quality of cinnamon is thought to be nothing unusual! I warn proprietors, however, to look carefully into the question of fine cutting, and to decide whether it is to their interest to persist in it.—Local "Examiner."

TEA AND COFFEE SUBSTITUTES.

(*Continued from page 732.*)

COMPOSITÆ.

44. *Helichrysum quinquenerve*, Lessing.—A sample of the dried leaves of this plant were shown in the Cape of Good Hope Court of the Colonial Exhibition, 1886, as Bushman tea, and said to be used as a substitute for China tea.

45. *Tarchonanthus camphoratus*, Linn.—A shrub, 6 to 8 feet high, native of the Cape of Good Hope, were it is known as Dagga. When fresh, the leaves have a peculiar camphor-like smell, hence the specific name; they are infused in the form of tea, and are supposed to have medicinal effects. They are also chewed by the Mahomedans, and smoked by the Hottentots. There is a sample of the leaves of this plant in the Kew Museum.

VACCINIACEÆ.

46. *Vaccinium Arctostaphylos*, Linn.—Under the names of Thé de Bel Dagh, Trebizond tea, and Broussa tea, the dried leaves of this plant have been variously known. It was noticed in the *Pharmaceutical Journal* for January 17, 1885, pp. 573-4, and March 21, 1885, pp. 771-2. In 1817, Mr. George Maw brought for the Kew Museum from Asia Minor a small sample of a native tea obtained at Broussa in Anatolia, where it was sold for about 8*d.* per pound. In a report by Her Majesty's Consul "On the Town and Port of Samsoon, and on the Circassian Colony in the District," contained in the *Commercial Reports from Her Majesty's Consuls*, 1884, part 1, p. 147, reference is made to the production of a native tea which considerably interfered with the import of China tea into the country. The Vaccinium tea is in appearance very like coarsely-prepared black Indian or China tea, and has a similar aroma—so much so, indeed, that the Customs authorities demanded duty upon the samples sent to Kew by Her Majesty's Consul; the taste of the infusion, however, has no resemblance to true tea. Upon submitting samples of the Trebizond tea for the opinion of a well-known firm of tea brokers, they remarked that common China tea showed a better value in every respect, so that the admixture of the Trebizond tea could hardly reduce the cost, while it would certainly not improve the flavour.

The following further notes on this subject are gathered from a memorandum by H. M. Vice-Consul at Samsoon. The tea in question became a commercial article so recently as 1880. At first its consumption was limited to the country, and particularly to those districts in which Circassian colonies had been founded. It is manufactured by Circassian planters in the neighbourhood of Amassia, Tokat, and Horek, all in the province of Roum, at a short distance from the forest, which clothes the mountain chain called Beldagh, and on which the plant which furnishes the tea in question grows in great abundance. The manufacture is carried on in the houses of the Circassian colonists who undertake this industry, and who appear to be pretty numerous. There are several gatherings of the tea; that which yields the best quality takes place in May. About 5,000 ocques (an ocque equals 2¾ lb.) are manufactured annually, but this quantity could be considerably augmented if there were occasion for it. The tea is sold on the spot at about 5 piastres per ocque. The cost of transport to Samsoon might amount to about 1 piastre, which brings the price per ocque to 6 piastres in that town.

The consumption is almost limited to the requirements of the vilayets of Sivaz (Roum) and Angora (Anatolia). It is to the town bearing the last-mentioned name that the greater part of the crop is sent. In 1881 a consignment was sent to France, but the transaction was not a profitable one. Some further consignments to Constantinople also do not appear to have been successful.

47. *Vaccinium hispidulum*, L.—A sample of the twigs of this plant is shown in the Kew Museum, under the name of Anise tea, from St. Pierre and Miquelon.

48. *Agapetes saligna*, Hook. f.—Described as a large epiphytic shrub of the Sikkim hills, at an elevation of from 1,000 to 5,000 feet. The leaves are said by Hooker to be used as a substitute for tea.

ERICACEÆ.

49. *Ledum palustre*, L.—An erect, small-leaved bushy shrub. Native of Canada and Labrador, where the leaves are used as tea under the name of Labrador tea.

50. *Ledum latifolium*, L.—The Cree Indians in the Hudson's Bay territory use the flowering tops of this plant as tea; they are gathered when in full flower, and dried, when they have an odour between that of Tansy and Camomile. The leaves are esteemed pectoral and tonic, and are said to have been used as a substitute for tea during the war of Independence. It is called Karkar-pukwa, or Country tea.

51. *Kalmia angustifolia*, L.—The twigs, with the leaves and flowers, are known by the Cree Indians in the Hudson's Bay territory as Bitter tea; the infusion is used more as a medicine than as a beverage.

52. *Gaultheria procumbens*, L.—A small, creeping, shrubby plant, native of shady woods in mountainous districts in Southern Canada and the Northern United States; it is known as Mountain Tea, Jersey Tea,

or Tea-berry. The leaves have a pleasant aromatic flavour, and an infusion is used in some parts of North America as a substitute for China tea, under the name of Mountain or Salvador tea.

STYRACEÆ.

53. *Symplocos Alstonia*, L'Her.—A small tree of New Granada, described as having the habit of the tea plant. The leaves, which are of a pale green colour, are employed as tea on account of their slight astringency. It is known as tea of Santa Fé.

LOGANIACEÆ.

53A. *Gærtnera vaginata*, Lam.—The seeds of this plant were introduced to notice under the name of Mussænda borbonica, but were identified at Kew in 1889 as those of Gærtnera vaginata. The interest at first attached to the seeds was on account of their use as a substitute for coffee. It was made the subject of an article in the *Kew Bulletin* for December, 1889, from which the following notes are taken:—The plant is a native of Réunion, and in a letter from the Consul to the Foreign Office, it is described as a shrub found in the forests, but not plantiful, bearing fruit only at the extreme ends of the branches. "The berry, when gathered, is peeled, and then much resembles the coffee berry, though smaller. In fragrance, it is inferior to coffee, and in colour to chicory. The yield is far less than that of the coffee tree, and the picking more expensive, that is to say, about 1s. the pound. It is much doubted, by reason of its inferiority, that Mussænda could ever compete with coffee and chicory, even if it were cultivated." From an examination made by Professor Dunstan, of the Pharmaceutical Society, it was proved that the seeds contain no caffeine, and that in consequence it cannot be regarded as a proper substitute for coffee. The result of Professor Dunstan's examination is printed in the *Pharmaceutical Journal* for November 16, 1889, p. 381. A sample of the seeds is contained in the Kew Museum.

BORAGINEÆ.

54. *Lithospermum officinale*, L.—The Gromwell of our hedges and copses is found also in other parts of Europe, and in the Basse Pyrenees; the plant is used as a substitute for tea, under the name of Thé de Montagne. A sample of this tea is contained in the Kew Museum.

SCROPHULARINEÆ.

55. *Veronica officinalis*, L.—A native of this country and of other parts of Europe, as well as in North America. The leaves, which are astringent and bitter, are made into tea in Sweden and some parts of Germany, and used medicinally as a stimulant under the name of Thé d'Europe. Simon Paulli contended that this tea was identical with the true tea of China. A sample is contained in the Kew Museum.

56. *V. Allioni*, Villars.—A glabrous procumbent plant, native of Switzerland, Southern France, Italy, &c. A sample of the dried leaves in the Kew Museum is labelled "Thé de Mont Cenis, used as a beverage on Mont Cenis."

57. *Capraria biflora*, L.—It is known as the West Indian Tea plant, Lunan says, according to Long and Barham, the leaves not only resemble those of tea, but make an equally agreeable decoction, which is also recommended as an excellent febrifuge. The plant is very common everywhere in the Savannahs.

Barham, writing of the plant says: "A Frenchman, captain of a ship, affirmed to me as we were walking about the town of St. Jago de la Vega, and observing this plant growing so plentifully, that it was the same as the tea plant of China that he had used in the part of the world many years, had seen large fields of it, and the manner of cultivating it, and all the difference was that the Chinese plant was larger, which he ascribed to such care and cutting of it, and had no doubt but the Jamaica plant if it were set in rich ground and attended with equal care would improve in size." Barham further mentions the fact of "a gentleman who never drank any other than West Indian tea, and that although he could not coil up the leaves so dexterously as they do in China, yet he performed this operation tolerably well, and every person whom he regaled with it extolled it as the very best green tea they ever drank in their lives. It is certainly unknown to what perfection it might be brought if reclaimed from its wild state, and cultivated in the rich soil of gardens, and it well deserves the experiments of the curious." The plant is a shrub widely distributed in the West Indian Islands, extending into Mexico, Brazil, Peru, as well as in Tropical Africa.—JOHN R. JACKSON, Museum, Kew.—*Gardeners' Chronicle.*

EEL WORMS AND ROOT GALLS.—The *Agricultural Gazette* of New South Wales for August, 1890, contains an elaborate account by Mr. N. A. Cobb of the eel worm (Tylenchus arenarius) which is causing great mischief to root-crops in New South Wales. A synopsis of the known species is given. When established, cure is impracticable; but prevention may do something by ridding the soil of the worms, or by putting such obstacle in their way as to render their ravages bearable. This may be done by the use of some chemical—preferably a fertiliser—which will destroy the larvæ before they have entered the roots; by the selection of some varieties not subject to the attacks of the creature; by trapping the worms and destroying them. To trap and destroy enemies numbered by the million, and hidden away under ground, might seem impracticable; nevertheless, a plan based on the life history of the creature has been successfully adopted in the case of Beetroot. Strubell, who obtained a prize from the University of Leipsig for an investigation into the nature of the disease affecting the Beetroot, observed that the larvæ, after entering the roots, did not become mature till after an interval or five or six week. Whereupon Professor Kuhn recommended that the plant should be pulled at the end of four weeks, when the creatures would die, and leave no progeny in the shape of eggs. By thus sacrificing two or three crops of seedling plants, the pest is so diminished that a crop of roots can be successfully raised. Gas lime applied to the soil would probably be efficacious. These pests are becoming more frequent, or are sooner observed than heretofore, not only in outdoor crops, but in the case of pot plants. —*Gardeners' Chronicle.*

A FEW OLD SIMPLES.—To allay hæmorrhage, a toad, well dried in the sun and put into a bag, was hung round the neck by a string sufficiently low to touch the region of the heart; and a preparation of garlic and honey smeared on the person was said to act as a charm against the bites of dogs and reptiles, or the sting of numerous insects, likewise effecting their cure. Toothache could be charmed away by a few leaves of the "shepherd's purse," placed in the sole of the shoe on the reverse side of the body to that in which the tooth was aching. An excellent recipe for weak or sore eyes was the expressed juice of the calyx of the red honeysuckle; provided always that the flowers were gathered kneeling, repeating nine paternosters in honour of the Trinity, nine more "to greet Our Ladye," and a creed. Rest and sleep were required after application. Another prescription for the eyes much in favour with the Anglo-Saxons was a paste made of the strawberry-plant and pepper, diluted with sweet wine. Children were passed through the split stem of a tree for the cure of the rickets, but the fracture must be afterwards bound up sufficiently tightly to ensure cohesion. For ague a very well-salted herring, split open, was applied, as hot as possible, to the soles of the feet. It might also be mitigated by the habitual wearing round the neck of an emerald—a gem equally potent in epilepsy. Precious stones were accredited with marvellous powers over the moral qualities and affections, as well as physical disease—hence the origin of their being set in rings and worn. The teeth of old age were fixed firmly in the gums by an infusion of powdered jet; while water in which the beryl had been steeped afforded a valuable wash for strengthening the eyes, besides ensuring the mutual love of a wedded couple.—*Hospital.*

CEYLON TEA AND THE NEW FRENCH TARIFF.

Mr. Mundella, the President of the Board of Trade, may justifiably be credited with the desire to see that all sections of British industry receive careful safeguarding when the terms of the proposed new French tariff have to be discussed between the respective Governments of Great Britain and France. It is questionable, however, whether any possible reduction of the present duty on teas imported into France would be beneficial in inducing its people to make such a change in their habits and tastes as to take to the use of tea instead of the present national beverage of coffee. We believe the existing rate of duty to amount at present to a little over one franc, or tenpence, the pound, and though comparatively high, this can scarcely be said to be a prohibitory tax. Of course tenpence strongly contrasts with the British rate at the figure (fourpence) to which the English duty has lately been reduced.

No doubt it would be a great thing for all growers of tea if the consumption in France and on the Continent of Europe generally, could be increased; but, as we have said, the item of duty upon the article is not the most important matter. A recent London Letter told us that a family in the South of France had been paying no less than seven shillings the pound for all the tea consumed by the household. Of such a price, the item of duty makes up but a small proportion. The question therefore must naturally presents itself whether so excessive a rate of cost may not be due to want of commercial activity in introducing the article. At the rate at which Ceylon tea could be imported into France—notwithstanding the existing high rate of duty—the retailer who vends tea at seven shillings the pound must be demanding a profit of something like three hundred per cent! If competition cannot be induced so as to greatly lower such a tax upon would-be tea drinkers, it is easy to see that there can be but little chance of the consumption of tea extending in France. It might, it seems to us, have a different result if really good tea was sold, as it might well be and with a satisfactory profit to the vendor, at something between three shillings and four shillings the pound. But even at such a rate there must yet remain a disadvantageous comparison between the cost of the coffee so freely imported into France and that of the tea which we desire to see largely supplant the former article.

So far as we are aware, the effort to introduce Indian tea to the Parisians has not as yet been marked by any great success. When that effort was first made, the hope was entertained that its effects would radiate from the capital as a centre throughout the provinces of the Republic; but this is scarcely likely to follow unless some further effort is made to reduce the prices at which tea seems still to be retailed in the localities the more removed from Paris itself. We could scarcely recommend such localities as a field at present open for direct attack by our own tea agencies. Our efforts are now quite sufficiently widely directed to occupy our attention for a good many years to come. But in spite of that fact, it may be as well that our distributors should bear in mind the disadvantages which are tending to restrain the French people from acquiring a taste for tea drinking. That restraint will be strengthened should the existing duty be, under the new proposed tariff, increased appreciably, and to the prevention of this we trust the interview had by our London Association with the President of the Board of Trade may materially contribute.

THE CEYLON LABOUR SUPPLY FROM SOUTHERN INDIA.

Like nearly all other large employers, Mr. H. L. Forbes, the Managing Director of the Scottish Ceylon Tea Company, felt during his recent visit to the island, that the labour supply was the most ticklish question in connection with the future of the Tea industry in Ceylon. We impressed on him in leaving, the advantage of learning all he could from a fellow-voyager, Mr. C. H. Greswell, a gentleman who, while knowing the Ceylon planting districts, had spent the last ten years in the centre of the labour supply districts in Southern India, as Resident Enginner on the South of India Railway. Both gentlemen travelled home by the P. & O. S. S. "Khedive" and the result is that we have the following interesting information from Aden, which we have no doubt will receive due attention from the Committee of the Planters' Association. In the first place Mr. Forbes writes:—

S. S. "Khedive," Gulf of Aden, March 26th.—We have had a fine run so far and hope to be at Aden tomorrow. It has been fairly cool till today which is very muggy and hot. With Mr. Greswell I have had several chats about labour supply, and enclosed is the result. All danger, apparently, of distress in Southern India has been wiped away by late rains. Undoubtedly what we looked upon as our own supply of labor has now also to serve other countries: the Cape largely. This is a very serious question and one which the P. A. should take up without loss of time; as if the migration to Burma, the Cape, etc. is to increase, our already too meagre supply will further naturally decrease. We must not allow other countries to become more liked than our own.

Mr. Greswell's letter is as follows:—

S. S. "Khedive," March 25th.

To the Editor "Tropical Agriculturist."

DEAR SIR,—Mr. Forbes has asked me for a few lines to enclose in his letter to you on the important question of the Labour Supply for the Ceylon tea estates. On leaving India I was not aware that any difficulty had been experienced by owners and managers of estates in obtaining coolies in sufficient numbers from the out districts in S. India. At one time owing to the partial failure of the N.-E. monsoon distress was predicted and Collectors of Districts were ordered by the Madras Government to submit special reports on the then existing state of affairs. These on the whole were favourable, and the rain which fell early in February removed all cause for anxiety. I am not in a position to explain wh the Ceylon planters should find it difficult to obtain labour now that confidence has been restored in the island and coolies are again paid regularly. Undoubtedly a great many emigrate to Burma and S. Africa and these countries afford a splendid opening for the industrious Tamil where in a few years he makes a small fortune. As an instance of this I may mention that only a few weeks ago I saw a batch of coolies alight at the Mayaveram station in the Tanjore District, and one of these had a large cash chest with him containing he said no less than 6,000 rupees. I asked him how he had managed to amass so much money. He replied that about 5 years ago he went to South Africa where the Government had given him a grant of land for supplying the men engaged in the Diamond Fields with vegetables and poultry; and he added he was now proceeding to his native village to buy land. According to the census returns the population of the Trichinopoly District has increased 95,000 during the last 10 years. The returns from S. Arcot, Tanjore, Madura and Tinnevelly Districts have yet to be published; but assuming their increase is in the same ratio, the question one naturally asks is what becomes of this (what may be termed) surplus population? As far as I have been able to observe the area of land now under cultivation between Villupuram and Negapatam, a distance of 166 miles much the same as it was eight years ago and yet,

it is not always easy to procure cooly labour, in fact during January and February last on account of the harvest all works in connection with the S I. Railway were more or less at a standstill for want of labour; and during the early part of last month when heavy rain fell the ryots were paying as much as 1s a day to their coolies for harvesting the ground-nuts which were beginning to sprout and had to be gathered in with as little delay as possible. On the other hand during the slack season which extends from March to July there is an abundant supply of labour, and it is then that a push is made with all Government and Railway Works. In July when the rains come down in flood, cultivation is resumed and the coolies return to the fields. If I had known before leaving India that the labour question was such an important one I would have inquired more fully into it and furnished you with details relating to the emigration of Tamils to other countries; as it is, I fear you will find the above remarks of little interest. On my return from leave to S. India, I will however indeavour to ascertain the cause of the falling-off in the labour supply to Ceylon from the districts I have already referred to.—Yours faithfully,

C. H. GRESWELL,

Resident Engineer, South India Railway.

We are much obliged to Mr. Gresswell and shall be glad to have his further reports by-and-bye. Clearly, however, there is to be no surplus of Tamil labour this year.

DR. TRIMEN'S TRIP TO THE STRAITS AND JAVA.

The M. M. S. S. "Natal" brought back Dr. and Miss Trimen after a pleasant trip extending over six weeks to the Straits Settlements and Java. Dr. Trimen has not fallen in love with the climate of Singapore which he considers hotter and more trying than that of Colombo. He was met by old friends in Sir J. F. Dickson and Mr. Trotter (Auditor-General) and very kindly received at Queen's House by Sir Clementi and Lady Smith. He also made excursions to Johore—where he met Mr. Turing Mackenzie, not over-satisfied with the progress of planting, and Mr. John Milne—and to Malacca, where he met a brother of our Auditor-General, Mr. O'Brien who is now Postmaster-General at the Straits. He also met Sir F. Weld, who looks the courtly old English squire and who, we regret to say, had returned from Pahang—which he came out to explore on behalf of an English Company, with an attack of "liver" which had quite laid him aside in Singapore when the "Natal" left. Sir F. Weld in his day has been one of the greatest of Australian and New Zealand explorers and bushmen, but he is too old now to presume on such work especially in tropical jungle.

The more important part of Dr. Trimen's trip was of course to Java. Here our Director of Botanic Gardens found a great contrast in many respects to Ceylon—the rich volcanic soil, the rather slovenly style of cultivation on plantations, the very happy contented appearance of the Javanese, the permanent location and easy-going ways of the Dutch, and above all the splendidly-equipped Buitenzorg Government Gardens, where the scientific staff includes no less than twelve Europeans, all graduates and "Doctors" and all busy in their several departments. The division of the 24 hours into two days and two nights is rigidly carried out almost everywhere in Java, so that when Dr. Trimen called at the Gardens after luncheon about 2 p. m., no one of the staff could be found! The siesta between 1 and 4 is a universal custom, while, to compensate, excursions are common after dinner up to midnight or 1 a. m., gardens and bands of music being then utilised as in English Colonies from 5 to 7 p. m. Anything will grow at Buitenzorg with the minimum of trouble, owing to the rich soil and moist climate; the Gardens are on a very extensive, luxuriant scale, though perhaps less attractive than our our own at Peradeniya.

Dr. Trimen was not impressed with what he saw of tea in Java; up to 3,500 feet above sea-level the tea gardens seemed of poor jât and careless management as compared with Ceylon. He was not able to get away to the great cinchona-growing region, but he found this article generally as little esteemed in Java as with ourselves of late years. The boom in Java at present seems to be in Liberian coffee which is being freely planted, and will apparently supersede the Arabian variety. Dr. Trimen saw little or no disease on it and the growth and crop are reported as satisfactory. He was told by English merchants in Batavia that proper preparation (a good drying of the beans) does away with the slight bitterness complained of, and now they get as good prices as for the best of the ordinary coffee. This was confirmed at Singapore: the Liberian variety is also as greatly in favour in Johore, &c.

When at Singapore, Dr. Trimen took the opportunity of seeing gambier prepared by the Chinese; he was able to follow the operations though a little puzzled as to how the final coagulation took place. Dr. Trimen has brought back some cubeb plants with him, but he has also discovered that already he has plants of the West Java variety growing in the Peradeniya Gardens. —Dr. and Miss Trimen return, we are glad to say, in good health, much pleased with their trip.

STEALING OF CACAO FRUIT FROM YATTAWATTA ESTATE.

P. C. MATALE, No. 5,843.

Sinduram Pulle Kanakapulle, complainant, *v.* Sinna Tambi accused. The charge here was that on or about the 7th day of February 1891 at Yattawatta, the accused was found in possession of about 8 lb of the unripe fruit of the cacao tree, of the value of R8, without being able to give a satisfactory account of his possession thereof, and thereby committed an offence punishable under Section 368 of the Ceylon Penal Code and the 2nd clause of the Ordinance No. 22 of 1886.

The accused was found guilty and was sentenced to four months' rigorous imprisonment and to receive 15 lashes. In his judgment the Magistrate narrated the circumstances of the case and added that thefts of cacao had been increasing of late to a very large extent. He did not therefore consider he would be doing his duty, if, in every case where it was clear that accused persons had been guilty of the offence of having unripe estate produce in their possession for which they add give no satisfactory account, he did not inflict a punishment that would deter others from indulging in similar offences. In this case he said Mr. Martin had proved that small thefts from his estate had been committed for some days before accused was caught. Since accused's capture Mr. Martin had not noticed any thefts.

MESSRS. GEO. WHITE & CO.'s Annual Tea Memoranda—already referred to in our columns—will be found reproduced so far as several of its more generally interesting paragraphs, on page 784. What is said about 'prospects,' 'additional outlets,' 'manufacture,' 'style of package,' 'bulking and packing,' 'marking' and 'analysis of crop' deserves the consideration of all practical tea planters.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, March 21st.

Annatto Seed.—The market is well, in fact almost over-supplied with seed. Two parcels, together with 175 bags from Ceylon and the East, were offered today, and 77 of these sold at 2d to 2½d per lb. for fair to good bright.

Essential Oils.—Citronella in tins was bought in at ¾d per oz., and Lemongrass at 1¾d per oz.

Quinine was reported rather firmer during the week, and yesterday it was even said that there were buyers at 10d, but no sellers under 10¼d per oz. for second-hand German bulk. The B & S agents say that 1s per oz. is ther lowest price. Neverthele s, at today's drug auctions tho article touched the lowest price yet re-recorded 1,000 oz of the Auerbach brand selling at 9¾d per oz; 2,000 oz Brunswick at 10d to 10¼d; and 4,000 oz Whiffen at 1s 1½d per oz. There has been very little business doue privately this week.

A FIRMER QUININE MARKET

in our last market review shows that the article was beginning to recover from the great and sudden break that had occurred the week before on the strength of most depressing news from London, and since that time further progress in the line of improvement has been made. As the decline in the first instance began in London so has the reaction been caused by reports emanating from that market. It is difficult to ascertain what caused the break unless it be the decline in the price of bark at the recent public sale in London, but as there has been in the past, even a greator decline in the unit price of bark without effect upon the quinine market, this explanation is hardly satisfactory. In view of the fact that the effort recently made to bring the manufactureres of the world into accord on the question of regulating prices and production failed because, as it is reported, ono manufacturer refused to lend assistance to the scheme, it has been intimated that the late extreme depression was the result of a bear movement inaugurated and continued for the purpose of compelling the recalcitrant manufacturer to co-operate in a measure designed for the general good. There is no evidence that the manufacturers have yet come together and unanimously adopted a plan to place the quinine market ou a substantial basis, while it is a fact that the market has recovered somewhat, therefore the cause of the improvement will have to be sought in somo other direction. The facts seem to be that the average speculative holder of quinine is seized with a panicky feeling whenever the article begins to shows evidences of unusual weakness from any cause whatever, and at once hastens to unload, thus increasing the weak tone of the market and quickening the downward movement. More confident buyers then step in, and after the pressure to sell has been relievod, the inevitable reaction occurs. This is au experience ofton repeated in the quinine market, and in the absence of any better explanation seems to fit the conditions recently prevailing in the quinine market.—*New York Oil and Drug Reporter*, Feb. 25th.

WILD FLOWERS OF CEYLON.

Nanuoya, April 6th.

Through Miss Martin's courtesy I am now able to send you the list of 54 of our hill wild flowers, portraits of which that lady exhibited at the Nuwara Eliya Show. The names have been carefully copied so as to render the task of the compositor and proof reader easy, while a careful comparison has been made with Dr. Trimen's list by Mr. A. M. Ferguson, junior, who has added Trimen's numbers in nearly every case, with native and other names, where given or known. With regard to the suggestion of publishing a work after the model of Miss Anne Pratt's "Wild Flowers of Britain," Miss Martin very reasonably doubts if sufficient encouragement could be calulated on for so expensive a venture. In any case, should publication be ultimately decided on, the lady artist feels that she must add very considerably to her present collection. She deems it probable that she will not have exhausted the hill country wild flowers (especially if she goes into orchids and ferns) under three years. This shows how rich our mountain region is in wild flowers. Meantime the advance list of those drawn, coloured and exhibited by Miss Martin is as follows:—

MISS MARTIN'S EXHBIT OF WILD FLOWERS.

1 Coleus inflatus, 623.
2 Sopubia trifida, 558.
3 Utricularia rosea, 563.
4 Eriocaulon quinquangulare. (Kok-mota), 907.
5 Sida carpinifolia, 87.
6 Campbellia cytinoides, 561.
7 Christisonia subacaulis, 562.
8 Burmannia pusilla, 767.
9 Balanophora indica, 687.
10 Euonymous revolutns, 164.
11 Vaccinium Leschenaultii, 443.
12 Strobilanthes Hookeri, 586, (*nilu*).
13 Parochetus communis, 209.
14 Smithia blanda, 217.
15 Gentiana quadrifaria, 517. (Gentian.)
16 Utricularia, 563.
17 Exacum Walkeri, 512.
18 Do. macranthum, 512.
19 Swertia zeylanica, 518.
20 Senecio zeylanicus, 433.
21 Emilia zeylanica, } 431.
22 Do. sonchifolia. (Kadu-para) } 431.
23 Pedicularis zeylanica, 559.
24 Hapenaria aristata } 822.
25 Do. spiralis } 822.
26 Satyrium nepalense. } 823.
27 Do. do. var. white } 823.
28 Spiranthes australis, 810.
29 Liparis Wightiana, 771.
30 Kingia Notouiana. (Diyanilla), 568.
31 Impatiens Walkeri } 118. (Balsams.)
32 Do. bipartita } 118. (Balsams.)
33 Do. acaulis } 118. (Balsams.)
33 Do. macrophylla } 118. (Balsams.)
35 Valeriana Moonii, 400. (Harebell).
36 Wahlenbergia gracilis, 440.
37 Pachystoma speciosum. (Daffodil orchid.) 777.
38 Barleria Arnottiana, 589.
39 Oxalis Carniculata. (Hin-embul-embiliya). 116.
40 Trifolium minus, p. 22. (Trefoil.)
41 Cynoglossum furcatum. (Bu-kattu-henda), 528. (Forget-me-not.)
42 Vernonia setigera, } 402.
43 Do. Wightiana, } 402.
44 Sonerila hirsutula, 302.
45 Osbeckia rubicunda.
46 Do. cupularis.
47 Hygrophila spinosa. (Katu-ikira S., Nirmulli T.), 580.
48 Commelina, 864
49 Phaius bicolor, 779. (Large ground orchid, A. M. HF. Jr.)
50 ibiscus angulosus, var. grandifloras. (Kapu-kinissa), 93.
51 Crotalaria semperflorens, 208.
52 Scutellaria, 629. (Skullcap.)
52 Hypericum, 69. (St. John's Wort.)
54 Asclepias curassavica.

Tobacco Disease.—In his note on the above subject, Dr. Cooke seems to have fallen into error when he says that Peronospora hyoscyami is "confined apparently" to Hyoscyamus. He does not tell us what species of Tobacco he refers to under the Tobacco of Australia. Peronospora hyoscyami has, according to Professor W. G. Farlow, badly attacked for the last four years Nicotiana glauca in Mexico and California, and great fears have been entertained in America of the pest spreading to the Tobacco-growing districts of Virginia.—W. G. S.—*Gardeners' Chronicle.*

CEYLON TEA MEMORANDA.

(*From Messrs. Geo. White & Co.'s Review for* 1890.)

PROSPECTS.—There is little probability that the causes which brought about smaller supplies than expected both from India and China in the season now closing, will be again in operation this year. We must therefore, in the ordinary course of events, be prepared for larger crops from India and Ceylon, while the better prices realised for China Congou throughout, and the high rates paid by Russian buyers at the northern ports for fine teas suitable to their requirements, will no doubt induce the Chinese to pick and manufacture considerably more. It must not be forgotten that in 1890 almost the whole of the second crop and part of the first was destroyed by wet and unfavourable weather, while the high rate of exchange also helped to curtail shipments. Fortunately, to meet this probable larger supply, our requirements have become greater, and show a slight tendency still to expand; but as the estimate of China given overleaf will most likely be exceeded, there will be a surplus, and prices current in 1890-91 must not be looked for.

ADDITIONAL OUTLETS.—Although the consumption of Tea in the United Kingdom has risen to rather over 5 lb. per head of population in 1890, against 4½ lb. per head in 1880, it would appear that the present consuming power of this country will not suffice to counterbalance the annually increasing output. It is therefore all the more important that every effort should be made to further foster the Trade in British-grown Tea with our Colonies, Europe and America. It is gratifying to note that shipments to Australia have shewn considerable development, the export from Calcutta 1st April, 1890, to 31st January, 1891, being 4,279,000 lb., against 3,156,000 lb. in 1889-90, and from Colombo 2,448,000 lb. against 1,076,000 lb. To America direct shipments from Calcutta are disappointing, as they have fallen from 174 000 lb. to 106,000 lb. in the same period, but from Colombo they have quadrupled, being 172,500 lb. against 42,600 lb. proving that the persistent efforts to push the Trade there have been rewarded.

As regards the Continent of Europe export figures from Calcutta and Colombo are not much guide, the great portion of the Trade being done from here. Considerable attention has been given to the promotion of business in both India and Ceylon Tea in Russia. The Government there is inclined to assist the introduction of these growths, and to prove the interest taken in the question one of the largest Russian buyers in Hankow called at Colombo on his way to China and is reported to have visited several Tea gardens.

MANUFACTURE.—Heavy shipments being expected from all the producing countries, it behoves British planters to use every endeavour to prevent the market being flooded with mediocre Teas of poor liquor. They will therefore probably find that by plucking a little finer than usual they will make much better Tea, and in the long run show a more satisfactory result financially, as the enchanced prices obtained will more than recoup them even should the total output be smaller.

Garden managers are much more independent of the weather than formerly, owing to the introduction of withering machines, such as "Blackman's." Manufacture and the use of patent dryers are also now so much better understood, that it is quite exceptional to come across over-fired, scorched, or sour invoices, which were noticeable in former years, and the few that are seen generally result from some exceptional cause. In the early part of the season many of the Assams had a peculiar musty flavour, attributed by some to the Tea having been packed too hot into damp or not thoroughly seasoned chests.

The requirements of the Trade vary from time to time, but thick rich liquoring parcels with a bright infused leaf, which cream over when cold, are always in request, especially for Ireland. Pungent Teas of good flavour, with a greenish infused leaf, have also been in demand for some time past. Ceylons with these characteristics have occasionally sold at high rates, but unless fine quality can be secured this style of fermentation is dangerous. It must be remembered, however, that a fancy article is liable to meet with capricious sales, as in the case of Ceylon greens. The first arrivals of these were particularly choice, and brought exceptional prices, but they did not appear to meet the public taste generally, and later shipments were very difficult of sale. Teas with good leaf are likely to be in favour, being used more freely by the large blenders than Broken Pekoes, which have been somewhat neglected unless possessing exceptional strength. Leafy kinds are also taken for export, and the demand is gradually increasing. Many gardens now send large breaks of 200 packages or more, which as a rule meet with spirited competition, especially in the case of Pekoe Souchongs which are suitable for the terminal market. Planters would probably find it worth their while to bear this in mind, and instead of making so many breaks to go in for three leading ones—viz., one first-class Broken Pekoe, Pekoe, and Pekoe Souchong, instead of say, two Broken Pekoes and two Pekoes—any remaining might be classified as Broken Tea or Pekoe fannings, and occasionally an odd package or two of dust.

STYLE OF PACKAGE.—For the Home Trade full chests are ordinary suitable, though many buyers prefer half-chests, especially for export. Leafy kinds, for self-drinking, often sell well in boxes, but to avoid the 1-lb. draft they should be under 28 lb. gross.

BULKING AND PACKING.—A large quantity of factory-bulked Tea has come to hand, and as more care has been displayed in filling the chests, so as to avoid crushing the leaf when treading in the last few pounds and thus altering its colour, they have been in favour with the Trade; while exporters prefer them, as they can re-ship them without the leads being cut. The tares must not, however, vary more than 2 lb. in each break, otherwise every package is turned out by the Customs authorities for separate tare. By attention to the scale on which the warehouse charges are at present based, a considerable saving may often be effected; as, for example, chests weighing 199 lb. gross, are not charged more than those of 160 lb. Half chests weighing 89 lb. gross, not more than those of 80 lb. Boxes weighing 28 lb. gross not more than 17lb.

MARKING.—We would again point out the objection which exists to marking either weight or tare on the packages, the name of garden, description of tea and chest number being all that is necessary.

ANALYSIS OF CROP.—The India crop of 1890 has, taken as a whole, been good, though from time to time quality has shown considerable fluctuations. Some of the Darjeelings have been of exceptionally fine flavour, while other invoices from the same garden have been much inferior, no doubt due to climatic influence. This has also been more or less the case with the Assams, but generally the quality improved as the season advanced. Dooars at times have been desirable and chiefly of a useful quality. Cachars and Sylhets were of ordinary character at first, though later shipments shewed some improvement. Kangras and Kumaons have throughout the season been disappointing in the cup, with the exception of a few invoices of each mark, they evidently, like the Darjeelings, having been affected by the inclement weather. Although some of the Travancores have been of good strength and flavour, the average of many gardens is low. The appearance of the dry leaf might often be improved, and no doubt this will be remedied as the out-turn increases. Not so much variation in the quality of Ceylons has been noticeable as in former years; the crop, though a very useful one, has been rather deficient in choice parcels. The general result should be satisfactory to garden proprietors, as although during a great portion of the season exchange has been high, they have not, as in the case of India, suffered from a diminution in out-put through the early setting in of cold weather. The rise in the price of silver also acted as a salutary check on the shipment of common China Congous. As previously noted, the general quality of Javas has shewn a distinct improvement in consequence of the plants raised from Assam seed becoming more developed, so that in many cases they are similar, to Teas of India growth. Although the total average price is still rather low, that obtained for the produce of several estates is very good, ranging from 10d. to 1s, 1d. per lb.

COCONUT *VERSUS* PALMIRAH.

European planters and native planters too who more readily copy the faults of their European guides than follow their virtues, cut down the palmirah to make room for the coconut. This is a senseless procedure. First because no other tree that grows high can ever injure the coconut trees, unless it shuts out air and light. On the contrary it protects the coconut trees from the effects of the frequent droughts to which the Pachchillapalli district is liable, if its leaves or branches are lopped off from time to time, when they show a tendency to obstruct air and light. The palmirah and the margosa are more conducive to the growth, preservation and fructification of the coconut trees than inimical to them. Secondly, because sixteen palmirah trees can very well stand in the space occupied by one coconut plant. Rejecting eight of these as male trees, we have 600 female trees per acre. Each female tree yields on an average 6 cents per annum, *i. e.*, R36 per acre. We get these R36 per acre without sowing, transplanting, fencing, watering, watching, digging, manuring, picking, peeling, drying, weighing, carting etc., all which have to be done in order to get something out of the coconut and this something, after deducting all expenses, can never exceed R20 per acre in this district.

If we take into account the interest of the capital laid out in the purchase of the coconut estate, the R20 will come down to R10. But if we take into account the interest of the money laid out in the raising of the coconut trees, the industry will be found to entail a dead loss of R30 or 40 per acre per annum. There is not a single estate in this district, but has changed four or five hands, the last purchaser paying not more than one-fifth or one-sixth of the original cost of planting up the estate with coconut.

If the palmirah be utilised for treacle, the male trees will also become available and the income per acre will be raised to R72 per annum.

It is usually said that the palmirah takes a long time to bear. If the attention paid to the coconut be paid to the palmirah, it will come into bearing at the same age at which the coconut does, *i. e.*, 20 years. People say that the coconut tree bears at so early an age as 4. This is true in exceptional cases. But I will not alter my limit of 20 years, unless one who has actually planted a coconut estate demonstrates to me that its income covered its own current working expenses before its 20th year. I won't ask him to include the interest of the capital laid out in the purchase of the land or in the various operations from the time the trees were planted to the time of their coming into full bearing. If these were included, no coconut estate would be found paying in this district.

The average age of the coconut tree is 60 years, that of the palmirah is over 100. When the latter dies through accident or exhaustion, the trunk is worth from 25 cents to one rupee, if not more. When the former dies, you require at least 5 cents to cut it down or burn it.

The palmirah cannot be choked out of existence by any foreign vegetation, but the coconut can be and always is. The palmirah sows itself, but the coconut does and cannot. The palmirah like the coconut has many enemies, such as cattle, beetle, drought, lightning, cyclones etc., but the palmirah withstands them much better than the coconut. It is a pity that the pioneers of planting did not plant palmirahs rather than coconuts in this peninsula.—*Com.*—Jaffna "Patriot."

DEATH OF THE *VICTORIA REGIA* AT THE GORDON GARDENS.

Our morning contemporary has the following:—

DEATH OF THE "VICTORIA REGIA."—This beautiful aquatic plant, which was brought from Madras and placed in the lower fountain basin in the Gordon Gardens, appeared to thrive at first. Afterwards, however, it seemed to be affected by sun and wind, and its large round leaves curled up. A cadjan screen was put up on one side, but that accomplished nothing, for at last the *Victoria regia* has died, and the remains have been removed.

With reference to the above a correspondent writes to us:—"I annex an extract from 'Firminger's Manual of Gardening' which may account for the demise of this plant, if no other cause has been discovered. I have not been to look at the plant myself for some time." The extract is as follows:—

"*V. regia.*—The plant is found not to exist more than two years, when its place must be supplied by a fresh one raised from seed, which in the vicinity of Calcutta it bears abundantly. If the seeds have to be conveyed to a long distance, it has been found that they will only retain their vitality by being kept in phials of pure water. . . . . . The seeds are sometimes very long in germinating." ("Firminger's Manual of Gardening for Bengal and Upper India," 4th Ed., Part IV, page 449.)

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.—From the list of those published in the *Journal of Botany* for January, we extract the following as being interesting to horticulturists:—

"THWAITES, GEORGE HENRY KENDRICK (1811-1882): b. Bristol, 1811; d. Kandy, Ceylon, Sept. 11. 1882. Ph.D. F.L.S., 1854. F.R.S. C.M.G., 1878. Local Sec. Bot. Soc. Lond., 1839. Lectured at Bristol, 1846. Superintendent, Peradeniya Bot. Gard., 1849; Director, 1857-1880. Contrib. Bristol list to Top. Bot. and to 'Phytol.' from 1841. 'Enumeratio Pl. Zeylaniæ,' 1858-64. Described *Dasygloia amorpha* for Eng. Bot. (2941). Pritz 318; Jacks. 612; R. S. C. v. 989; Proc. Linn. Soc. 1882-83, 43; Gard. Chron. 1874, 438, with portr.; 1882, ii., 505; 'Athenæum,' 1882, 500. Portr. Kew. *Thwaitesia*, Montagne. *Kendrickia*, Hook f. —*Gardeners' Chronicle.*

THE GINSENG TRADE IN CANADA.—Ginseng, the root of Panax quinquefolia, var. Selimseng, is well known as a valuable medicinal product of China, Manchuria, and Corea. A kind of Ginseng, P. quinquefolia proper, is also grown in America, and the root exported thence to China, but this industry has of late years much declined. Under the title, however, of "The Revival of an Old Canadian Industry," our contemporary the *Chemist and Druggist* has the following:—"Ginseng, the drug *par excellence* of Chinese *Materia Medica*, was formerly extensively collected and dried in Canada. It was one of the first articles of commerce exported from Canada after the Peace of Utrecht, and for a time considered hardly less important than the fur trade. This plant was discovered growing near Lachine, by the Jesuit Lafitan, in 1716. He had learned of its value as a medicine in China, and a Company was formed for its export to China, Tartary, and Japan. When first introduced, the price at Quebec was from 30 to 40 dollars (or cents) per lb, and anyone was permitted to sell the plant. But in 1751, the Company obtained a monopoly, and excluded all others from the trade. The price rose to 12 livres, and at one period even to 33 livers per lb. As the demand for the plant increased, the care with which it was obtained and prepared was relaxed. It was gathered out of season, and dried imperfectly before it was ripe. Under these circumstances Canadian Ginseng soon lost its reputation in China, but during the time when the drug realised high values, agriculture was neglected altogether in some localities, the entire attention of the inhabitants being given to the collection of Ginseng, with the result that in some parts of Canada the plant entirely disappeared. When the trade was at its maximum in 1752, the value exported was about 500,000 livres per annum, but two years later it had sunk to 33,000 livres. The Company then ceased to purchase the plant, and the trade entirely disappeared. All that remained of it was a proverb among the people, when speaking of some matter having failed, that it had come to nothing as the ginseng, *C'est tombe le Ginsong.* It is a strange fact, that the word Ginseng has the same meaning both in the Chinese and Iroquois languages. At present Ginseng gathering is again becoming a large industry in Canada, the root being collected for sale to the Chinese in the United States."—*Gardeners' Chronicle.*

COCOA AND ITS CULTIVATION, AND THE PREPARATION OF CHOCOLATE.

The cocoa tree is very common in the warm regions of America, but since the conquest it has been cultivated in Mexico, in Guatemela, and Nicaragua. Under the kingship of Montezuma, the Spaniards transported this tree to the Canaries, to the littoral of Venezuela, to the Antilles. The cocoa tree requires a rich soil, deep and damp. Nothing suits it better than a grubbed-up forest. All the plantations are similar; shady localities, at a short distance from the sea or on the banks of rivers. When a piece of land is selected as fit for the cultivation, a commencement is made by assuring a system of shade. If it is to be grubbed up, the trees which have been stripped are left standing, or else there are planted some shrubs of rapid growth, such, for instance, as the *Erythrina umbrosa* (bonana tree.) To the South of the Equator, in the province of Guayaquil, the planting is done directly by seeds, while in Venezuela they are planted out as seedlings, in the latter case every precaution being taken to protect the young plant against the sun's rays. The seeds germinate in eight or ten days; in the second year the cocoa tree reaches a height of about a yard, and it is then that it is topped. The tree generally flowers at the age of about thirty months, when climatic conditions are favourable. There are few plants, the flowers of which are so small, and especially so disproportionate to the size of the fruit. The flowers do not appear separately, but in bouquets, on the same stem, at all elevations, on the mother branches, and even on the ligneous roots running along the surface of the soil. A gentleman, who has lately studied the question, in his researches on the constitution of the cocoa berry and on the composition of chocolate, gives some interesting particulars as to the distances which separate the trees and the care brought to bear on their cultivation. From the fall of the flowers to maturity nearly four months elapses. The fruit, or *cabosse*, is divided into five lobes; its weight varies from 300 to 500 grammes. The seeds which are taken from the fruit are exposed to the heat of the sun; during the night they are raked into a heap under a shed. An active fermentation soon set in, which would be hurtful were it allowed to increase. From 100 kilogrammes of fresh seeds our authority has seen 45 to 50 kilogrammes of dry and vendable cocoa extracted on a hacienda in Aragua. A cocoa tree which has attained the age of seven to eight years annually furnishes an average of o kilo. 72. At Gigante, in Upper Magdalena, the yield is about 2 kilos. The cocoa is decorticated by the application of moderate heat; the shell having become weak, it is then removed by the winnowing. In torrefication the berry acquires, like that of coffee, an odour, due to a low proprotion of a volatile principle. This is the aroma perceived in chocolate. The cocoa berries are rich in nutritive principles. Independently of a strong dose of fatty matter, they also contain azoted substances, similar to albumen and caseine, theobromine and compounds of ternary composition, these elements necessarily varying in quantity according to the place of growth. Numerous analyses have been made at the Conservatoire of Arts and Sciences. The following is the result of an examination of cocoa, coming from Trindad:—Butter, starch, theobromine, asparagine, albumen, gum giving mucic acid-tartaric acid free and combined, soluble cellulose, and matters of an indeterminate nature. As is well known, decorticated cocoa slightly roasted, and separated from the seeds, is the basis of chocolate. In the products of French factories, there have been found in chocolate from 55 to 59 per cent of sugar; in Spanish products, 40 to 53 per cent. In chocolates honestly prepared only cocoa and sugar should be present, too large a quantity of the latter weakening the quality. Thus, the gentleman from whom quotations have already been given, when about to start on a long journey in America, procured a preparation of 80 parts of cocoa and 20 parts of sugar, a composition represented by:—

	Parts.
Sugar	20
Butter	10
Albumen	41
Phosphates	3
Other matters	26
	100

This was a useful addition to the ration which consisted of meat dried in the air (tassajo), maize biscuits, or cassava cakes. The Mexicans made a paste with cocoa which they called chocolate, in which they mixed a little maize. Up to the sixteenth century travellers differed widely in their opinions as to chocolate. Acosta considered from a prejudiced point of view. On the other hand, Cortes probably exaggerated the value when he pretended that by drinking a cup one could march throughout the whole day without taking any other nourishment. In France, the new drink had its partisans and its detractors. Madame de Sévigné, in a letter to her daughter said "I have wished to reconcile myself with chocolate: I take it in the afternoon to digest my dinner, with a view to supping well, and I take it to nourish myself, and in order to fast till the evening; it has brought about the effects I wished; that is why I find it pleasant; it acts according to the intention."

Chocolate in its small volume contains a large portion of alimentary matters. Humboldt says that it has been truly remarked that in Africa rice, gum, and shea butter aid men traversing the desert; and in the New World, he adds, chocolate and maize flour render accessible to him the plateaux of the Andes and the vast forest. By the addition of albumen, fat, of the congeners of sugars, and the presence of phosphates, cocoa recalls the composition of milk, the type according to Prout, of every nutritive regimen. Having arrived at a certain stage of civilisation, man frequently adopted into his food plants which acted on his organism in the manner of fermented drinks. Like wine taken in proper quantities, these aliments favoured digestion, improved the memory, exalted the imagination, and developed a feeling of well-being without giving place to a hurtful reaction so often the case in the abuse of alcoholic drinks.

It is a curious fact that human races, separated by the greatest distances and never having had any communication the one with the other, prepare, with certain vegetables, exciting drinks, such, for instance, as tea in China, coffee in Arabia, cocoa in Peru, mate in Paraguay, cocoa in Mexico, utilising either the leaves or the seeds of plant of which the seeds of plants of the botanical species have no analogy, but which, despite this difference of natural source, exercise a similar action on the nervous system and on digestion. The reason is that there are in these different plants substances possessing the constitution of alkaloids, and endowed with similar properties; that is, cafeine in the leaves of tea plant, of maté and in coffee, cocaine in the leaves of coca; and theobromine in the berries of the cocoa tree. Thus the Chinaman, the Arab, the Pernvian, the Paraguayan Indian, the Inca, and the Atzec were under the influence of a similar agent when they had taken their habitual drink.—*Indian Grocer*.

[This is the first time we have heard of the "*The Indian Grocer*"?—ED. *T. A.*]

COFFEE IN BRAZIL.—The following communication, addressed to the *Jornal do Commercio* of this city, was published in that paper on the 5th instant:—"I have seen in the *Jornal do Commercio* an item taken from the *Rio Novense*, of Rio Novo, in regard to the coffee crop of that municipal district. From the observations I have made of the heavy flowering in the north of S. Paulo, I can assure you that the trees will not produce more than half the crop that flowering seems to promise."—*Rio News*, Feb. 10th.

KOLA: WHAT IS IT?

By Thomas Christy, F.I.S.

Having been consulted by several gentlemen who are manufacturers as to the best way of administering kola and introducing it amongst workmeu, I thought it would interest you if I furnished you with a copy of my reply.

It is well known that intoxication or drunkenness may be produced from several causes, one may be the craving for drink from overwork, or from indigestion, or from pain; and in old times it used to arise from sitting in the public-house for want of something better to do; but in the present age of newspapers and the advance in education, a very large number of people who used to drink for want of something better to do now have not this excuse, therefore it is easier to attack the causes enumerated. It has been found that kola has an extraordinary effect on beer and spirits, and large bottling establishments, where the "ends" of the casks have been drawn down as low as it was thought safe, the thick residue has been emptied into large casks, and a small quantity of kola stirred round, and in quite a short time it has cleared the beer to such an extent that nearly the whole quantity could be bottled off without in any way impairing its keeping qualities.

At the Linnean Society we had the evidence put before us from gentlemen living in the West Indies of what they had repeatedly witnessed, viz., that men who are insensibly intoxicated are by the use of kola restored in a very short space of time to sobriety; a bad headache, produced perhaps by new spirit, is acted on in a very short space of time, but what is of more importance is this, that the craving for drink is at first suspended, then stops, and a more healthy state of the system follows; bodily exercise is enjoyed, and the mind appears bright.

No more than the owner of a mill or factory regrets the loss of the assistance of his manager or best workmen from intemperance, and to my knowledge the most happy results have ensued from kola in some form or another being used. When the head of a family brightens up he infuses a healty tone to all around him.

In the year 1520 cocoa was introduced, and it got better known about 1659. I do not propose to go into the merits of this fruit. Suffice it to say it contains about 50 per cent. of butter, which has to be extracted or thrown down by the addition of starch before it can be used as a beverage, or it would produce indigestion.

With tea the relief to a weary body is very temporary, and for a brain-worker the tannin sorely troubles those who use it as the most convenient form of stimulant.

Coffee, pure and of good quality, well made, is one of the greatest rarities, and few things are more adulterated before it reaches the consumer. Kola is consumed by a large number of the African tribes, and reports sent home lately to the British Government showed that those labourers who took it as food could do double as much work in one day as those who did not. The reports in the Press have been so ample that I only desire to quote instances that have come lately to my knowledge. I am very proud of having been the introducer of this valuable food, and my reticence on the subject will be appreciated. Many of the most wonderful records of cycling against time have been chronicled as largely due to the use of kola. The riders say that though the exertion of the body was at the utmost stretch, still the head and brain were clear and the physical powers were strengthened. Even a small quantity of kola had a magical effect; it appeared to be as much a tonic as an anodyne to the brain, and whereas only a few minutes before the whole of the machine was as laborious to work as the treadmill itself, the efforts of the rider were made pleasurable exercise, and the desired speed was attained with less exertion and the happiest results, so that "beating the record" seemed an easy matter. There was no sense of lassitude or prostration, but instead a cheerful feeling pervaded the system; a healthy appetite was created for food, and what was more important, it was digested with a satisfaction seldom experienced before.

During the late examinations many ladies felt the usual anxiety to surpass the "lords of creation," and in London they also had to endure the thick atmosphere from the fog so trying to delicate organisations. I recommended fathers who were in despair when their daughters declared that they must give in, to try kola, but of course without giving any details as to what it was.

In certain cases they took it for breakfast, and then again in the form of chocolate for lunch. The result was a success, and aided by the assistance to the bodily and mental powers thus given, the highest positions were gained, without the recurrence of headache or nervousness.

For working people kola is prepared in the form of chocolate, so that it can be carried in the pocket and a small piece broken off and eaten when the feeling of hunger, thirst, or weariness occurs. It acts in a few minutes. A teaspoonful of kolatina at breakfast, in hot water or milk, or even alone, is sufficient for a breakfast, but the effect lasts for several hours.

Many people who know of this preparation employ the pure kola nut, ground to a fine powder. This they boil with milk, but it is an acquired taste.

In the early part of this year a coloured doctor informed me that the men carrying goods for sale go away from the coast for journeys of 24 hours; all they depend upon are kola nuts and water, and they bring back loads of goods that they have taken in barter.

In Western Africa kola nuts have even taken the place or rather fill the place of a currency in some parts, and are very highly esteemed by the natives.

I give the following letter from Mr. A. E. Floyer, F. L. S., an intrepid traveller:—"I think there can be no doubt that kola chocolate is a genuine good thing. I have used it a great deal lately, and I think the following test (which I am about to say, was in some points involuntary) conclusive. I went into the hills on the morning of the 9th with my shikarri; we did ten hours' very severe climbing, much of it anxious work, in the dark; we slept on the rocks, and the next day ten hours' more very severe climbing, and at last got out of the mountains. It is no exaggeration to say that we arrived at the camp in capital spirits, though very leg weary. During these two days we had divided between us four biscuits, three oranges, and three tablets of kola chocolate; practically nothing but kola. It seems to have no ill effects, nor interferes with ordinary stomach arrangements or with sleep. Half a cake at 10 a.m. and the same at 3 p.m. and you can wait till midnight before you lunch, and have a good appetite when you get it.

I am confident that its extraordinary properties have only to be generally known to be recognised by all classes of the community, and more particularly by persons whose occupations are such as to involve constant and sustained employment of their vital powers.—*Cheshire County News.*

INSECTICIDES.

The following notes by Dr. J. C. Neal, the entomologist to the State Agricultural College, Florida, U. S. A., will be found of interest:—

Nothing has been done in practical entomolgy that has shown better results than the use of emulsions containing kerosene or insoluble poison held in suspension, and their application to infected plants in a fine spray by various atomisers and spray pumps. With one of these machines, an insecticide can be brought into contact with the insect, and its feeding ground thoroughly impregnated with poison. It is needful that the spray be very fine, and that it be applied with force to reach every infected part, or the hiding-places of insects. For cases like infected buildings, as chicken-houses, that are usually very difficult to keep clear of mites and tick-fleas, the spray of carbolised whitewash, tobacco, kerosene, oil of Tansy, &c., is easily applied.

I append a few formulas that have been tried and found to be valuable:—

I.—SOLUTIONS.

1. Tobacco, 1 lb.; boiling water, 3 gallons; strain when cool. Very effective when used as a spray against flea-beetles, lice, aphides (plant-lice), and ticks.

2. Quassia-chips, 1 lb.; boiling water 3 gallons. This very bitter solution is good for prevention rather than cure. Apply as a spray to Rose bushes, and to kill plant-lice.

3. Pyrethrum; 1 oz. of the "Buhach" powder added to 2 gallons of cold water for Cabbage, Beets, Tobacco, or any plant used for food, as this is not poisonous.

4. London Purple, Paris Green; actively poisonous. Use 1 lb. of the poison to 200 gallons of water or other solutions. Dissolve a little flour paste in the water to make it sticky. Stir frequently. Applied to trees, it is a sure cure for all insect plagues.

5. Bordeaux Mixture.—This, while primarily a fungicide, has some good qualties as an insecticide. It is prepared thus:—1 lb. sulphate of copper, dissolve in 1 gallon of hot water in one vessel; in another, 1 lb. rock lime is slaked in 1½ gallon cold water, and, when cool, pour into the copper solution and strain; add 2 gallons of water, and it is ready for use. (Cook).

6. To this, add London Purple, 1 lb. to 200 gallons of the Bordeaux Mixture. This sprayed over non-bearing Grape vines or Tomato vines not in bloom, &c., will prevent rot, and insect life as well.

7. Soap.—1 lb. resin soap to 1 gallon hot water. This, used as a spray, is often a valuable remedy for the attacks of small and soft insects; in fact it can be used to advantage for soft scales, when they are few. It should be often used to get the best effect.

8. Water in which tar has been placed acquires some value as an insecticide.

II. EMULSIONS.

1. Stronger Emulsion of Kerosene.—4 lb. soap, dissolve in 1 gallon hot (boiling) water; remove from the fire, and add 2 gallons kerosene while hot. Churn with a spray-pump violently till the oil is emulsified; add 27 gallons cold water for use.

2. Weaker emulsion (Cook).—1 lb. soap dissolve in 2 gallons hot water as before, but add only ½ gallon kerosene, and dilute till 8 gallons are made. Adding ½ pint spirits turpentine to No. 1, increased its stability (Tracy). Allowing even 40 gallons of water to be added to 1 gallon of the emulsion, and sprayed on Tomato worms, it was very effective, and did not injure the plant in the least.

3. Emulsion 1.—Adding 2. oz. of balsam of Fir with the kerosene makes an emulsion that adheres better to the surface of the leaves, and is slightly superior to No. 1 for the armoured scales.

4. Using emulsion 2, only substituting the same quantity crude carbolic acid for kerosene, is especially valuable for Oak and Pear insects.

5. The same formula, using oil of Tansy or Sassafras 1 oz. in place of the ½ gallon kerosene, is efficacious for roaches, mites, ticks, bed-bugs, and pests.

III. ARSENICAL, RESINOUS, AND OTHER COMPOUNDS, FOR SPRAYING.

1. To kerosene emulsion No. 1 add 1 oz. London Purple, and mix well. Highly recommended.

2. Resin compound.—Caustic soda, 1 lb.; resin, 8 lb.; to make 32 gallons compound. Dissolve the soda in 1 gallon boiling water; take out half; add the resin slowly to the remainder and boil, stirring rapidly; when dissolved, add slowly the part taken out. Dilute till it will pass readily through a thin cloth, which should be always done. Dilute before using, to 32 gallons. This alone is very valuable against most scales, but the addition of 2 oz. London Purple makes assurance doubly sure, against even the dreaded Icerya.

3. White arsenic, ½ lb.; sal soda, ½ lb.; water ½ gallon; boil till a solution is made, then dilute to a gallon. One quart of this to 50 gallons resin compound—use on Peach, Pear, and Plum, either after fruit is gathered or just as bloom has fallen.

IV. POWDERS.

1. While slaking 1 peck fresh lime, add 1 quart of kerosene, sift out lumps; apply lightly to Cucumbers, Melons, and Tomatos, for beetles and squash-bugs.

2. 50 lb. land plaster, mix 1 pint crude carbolic acid; sprinkle over leaves and Vines for aphides and beetles.

3. Pyrethrum.—This, the powdered flowers of the Pyrethrum, when fresh, is especially valuable if sprinkled on infected leaves, or in boxes, drawers, &c. House flies and mosquitos are easily subdued by closing up the room tightly and slowly burning in it a spoonful of the powder. It is slightly narcotic, but not at all dangerous to human life. For infected Cabbage, Lettuce, Celery, and the like, or Tobacco, it is the best insecticide we have, involving no danger if eaten.

4. Tobacco.—This insidious narcotic is valuable in the destruction of plant-lice, mites, &c. Applied either as a powder or by its fumes it often is quite beneficial.

Bisulphide of carbon, like chloroform, is highly volatile, but its vapour, unlike that of chloroform, is very explosive. Bins and corn cribs can be easily rid of ants, weevil, rats, mice, beetles, &c., if the room be made air-tight, and occasionally filled from the top with the vapour of bisulphide of carbon.

This is the only way in which our farmers ever will keep Corn, Peas, &c., from insect attacks,—*Gardeners' Chronicle.*

MR. T. S. ANDERSON, of the Gartmore Estate, inserts this advertisement in the Ceylon papers: "Not having sufficient tea from which to supply the great demand in the London Market for Golden Tips, I undertake under certain conditions and for a Fee of R125, to shew Planters how to prepare the same. The Tea, so prepared, will be guaranted to be equal to the sample of Gartmore Tea, sold in Mincing Lane for £10 12 6 per lb. and the manufacture to cost not more than 25 cents extra per lb." This is all very well, but can Mr. Anderson tell us (1) to what extent the value of the rest of the leaf is depreciated by plucking golden tips; (2) what demand there is in London for tea at £10-12-6 per lb. It is all very well paying a fee of R125, spoiling the bulk of your tea, increasing the cost of manufacture by 4 annas to find that when it arrives in the London Market 2s or 2s 6d per lb. is the outside it will realize, which will probably be the result should any large consignments of Golden Tips be made.—*Madras Times.*

The ARTIFICIAL MANURES, &c. (ADULTERATION) BILL, which was introduced into the House of Commons and read a first time in November, but which has just been issued in a revised form, has for its object the better prevention of frauds in the manufacture and sale of artificial manures and other preparations for agricultural purposes. This it proposes to attain by making it compulsory, in all sales in quantities of not less than one hundredweight of artificial manure or feeding stuffs, for the seller to deliver to the purchaser a guaranteed analysis of the article sold, and by making misrepresentation in this certificate punishable by summary process. In order to facilitate the carrying out of the law, the Bill provides for the appointment by every County Council of "one or more persons possessing competent knowledge, skill and experience as analysts of artificial manures and feeding stuffs within such county," from whom purchasers will be entitled to obtain an analysis on payment of a fee of 5*s*. All appointments of these analysts would be subject to the approval of the Board of Agriculture, which may require to be supplied with satisfactory proof of competence; but the only other limitation is that no person shall be appointed as analyst who is engaged directly or indirectly in the trade or manufacture of the substances he may be called upon to examine. The Board of Agriculture would also be empowered to authorise a County Council for a specified time to appoint inspectors to obtain and deal with samples of manures and food-stuffs offered for sale in a manner corresponding to the provisions of the Sale of Food and Drugs Act.—*Gardeners' Chronicle.*

QUININE AND JAVA CINCHONA.

The market value of quinine has now declined to a point unprecedented even in the history of the Fallen Drug. Yet in Mincing Lane there are still many who, more unteachable than the Bourbon kings, appear to have learnt nothing, and forgotten all of its previous commercial history. Every other man one meets, no matter how ludicrously his forecasts have been falsified in the past, still clings to his own pet theory on the subject of the future of the quinine market, and the number of those who, with "Athena's wisest son," are frank enough to admit "all that they know is, nothing can be done," seems scarcely greater than that of the just men in the Cities of the Plain.

A favourite assertion just at present is that the price of quinine fluctuates altogether independently of the movements of cinchona bark, that, in fact, the two articles now revolve in different spheres. We are no adherents to that theory. On the contrary, we have more than once stated our view that the natural causes which have operated to depress both cinchona bark and its derivatives have been assisted by the unwise contracts made by certain Java planters with Continental quinine manufacturers of a speculative turn of mind. Full particulars of these contracts were published in this journal last year, and their substantial accuracy stands unchallenged. A variety of minor causes, such as the condition of the money market, the avowed, if unintelligible, policy of at least one of the English manufacturers to depress quinine, and so forth, have accentuated the state of limpness from which that drug is now suffering, but we see no reason to alter our opinion that the primary cause of the depreciation of quinine lies in the excess of the bark supply, and that a curtailment of the production of cinchona must precede any lasting improvement in the quinine market. So far as Ceylon is concerned the output of bark is already visibly dwindling away, and will continue to lose importance year by year as a factor in the calculations of the quinine dealer. The official export figures, which we quote below, are eloquent on this point:—

CEYLON EXPORTS.

1886	1887	1888	1889	1890
lb.	lb.	lb.	lb.	lb.
14,675,663	12,805,003	12,482,817	9,455,641	8,779,140

The displacement of Ceylon by Java, as the centre of cinchona production, is now as much an accomplished fact as the dethronement of Chinese by Ceylon and Indian teas in the British markets. Until 1890 it seemed doubtful whether Java would ever gain the mastery of the cinchona market. But in that year 4½ million ounces of quinine in the bark were sold by public auction in Amsterdam against 4 million ounces disposed of at the cinchona sales in London. That fact marks the commencement of the era of a Dutch supremacy in the cinchona market. There is no use whatever blinking it, however unpalatable it may be to London importers and brokers; and if the recognition of it should lead to the exercise of greater care and discrimination by the Ceylon planters, and the modernisation of London sale methods, our present loss may prove our future gain. We are induced to make these observations *apropos* of the annual report of the Soekaboemi (Java) Agricultural Association, just published. From this report, which is compiled with the greatest possible care, and forms a valuable guide to those interested in the progress of cinchona, it appears that the total crop of Java cinchona, for manufacturing purposes, in 1890 was 3 million kilos. The estimated crop for 1891 is 3½ million kilos. The average equivalent of sulphate of quinine in the bark was 3·94 per cent. last year, and is estimated at 4·07 per cent. for 1891. The total quinine yield of the Java manufacturer's bark of 1890 was 120,000 kilos, fully one-half of the world's estimated consumption. This year it will be 140,000 kilos., or about four-sevenths of the world's estimated consumption for 1891. We have tested two former estimates published by the Association in 1890 and 1889, and in each case found them to be somewhat below the actual yield. There is therefore no reason to believe that the estimated figures for 1891 are exaggerated. There are now 114 known cinchona plantations in Java—in 1889 there were 115—and of these only 30 neglected to send full particulars of their cultivation to the secretary of the Association. Fifteen plantations will yield no crop at all this year, mostly because the trees are as yet too young, and only four or five are reported to have been "abandoned" or "uprooted." The facts are that, in spite of four or five seasons of starvation prices, the number of cinchona plantations in Java has not lessened. In 1888 there were 10,622 bouws (1 bouw = 1¾ acre) under cinchona in Java, in 1890 there were 18,126 bouws. Another fact worthy of consideration is the existence of a tendency to a decline in productivity in the larger plantations. Thus, the nine largest estates on the island, including the Government plantations, yielded a crop of 1,168,156 kilos. bark in 1890, but they only estimate their ouput for 1891 at 912,000 kilos. The Government plantations produced only 240,000 kilos. bark last year, instead of an estimated yield of 300,000 kilos. This yield included 95,000 kilos. pharmaceutical bark. But the reduced output was not owing to natural causes so much as to partial compliance with the desire of the private planters that the Government gardens should temporarily cease to put forth their full strength, and thus help them to tide over a bad season. The result of this accommodation on the part of the Government is that they will have to get rid of their surplus in 1891 and the succeeding years. Hence their output for 1891 is estimated at 212,000 kilos. manufacturing, and 150,000 kilos. pharmaceutical bark. Two other possible portents of things to come lie in the facts that nearly all the medium-sized plantations in the western cinchona districts of Java are anticipating a considerable increase in their output, and that the figures denoting their area under cinchona cultivation point to a further decided increase in the near future. Take, for instance, the nine principal plantations alluded to above. They are among the oldest in the island, and their bark is the best known in the markets. Their total area under cinchona covers 3,687 bouws, and their yield of dry bark in 1890 has been about 317 kilos. bark per bouw. Now select nine other typical plantations from among the large number of those which have not yet attained their full producing power. These nine plantations cover an aggregate of 3,747 bouws. In 1890 they produced 46,400 kilos. bark or about 124 kilos. per bouw. In 1891 they are estimated to produce 536,000 kilos., or 143 kilos. per bouw. When they shall have attained the ripeness and producing power (317 kilos. per bouw) of the nine most fully matured estates in the island, they ought to produce 1,187,799 kilos. These figures do not look as if the supply of bark from Java is about to dwindle away. Yet, in spite of the tale they tell, a number of Mincing Lane people affect to treat the Java bark-production as a factor of no account in the quinine market. There is room in the drug market for an "Ancient Mariner," who stoppeth some of these, and for his hearers' own ultimate benefit, if not present delectation, keeps dinning into their ears the true moral of the story from the islands of the East.—*Chemist and Druggist.*

LIBERIAN COFFEE IN THE STRAITS.

The statement we append will be read with interest by those planters and proprietors who are now turning their attention to the cultivation of this product. The Native States of the Malay Peninsula which have been opened up to coffee cultivation by European enterprise—principally through planters of Ceylon experience—are situated on the Western slopes of the mountain chain which traverses the entire Peninsular from North to South, forming as it were a "backbone," rising from 2,000 to 4,000 ft. in height, but decreasing on proceeding to the South. The surface is well watered, and very heavily timbered. The coffee, solely Liberian, is planted on the slopes of the main range, and on isolated hills, of which there are a vast number studded over the country. Estate bungalows are constructed entirely of timber obtained on the spot, and roofed in with *attaps*, the plaited fronds of a palm which grows in several varieties. The timber

felled and burnt off in opening up an estate would be of immense value could it but be got to the coast for export. The state of Johore extends from the territory of Malacca to the Southern shores of the Peninsular, and is separated from the island of Singapore by a narrow strip of water. Like the other States it is a British Protectorate, and the Sultan, an enlightened Malay nobleman, offers every encouragement to European enterprise. Sungei Ujong is situated North of Malacca and South of Selangor, and contains several very flourishing estates, notably those belonging to Messrs. Hill and Rathborne, a large and flourishing firm of planters and contractors, who have done much towards opening up the Peninsular to European enterprise, both in the matter of planting experiment and making roads. The State of Perak is North again of Selangor, and adjoins Siamese territory. Both Perak and Selangor are promising fields for the planter. The soil on the hills and plains is most fertile, water is plentiful, and the rainfall abundant. Both States are flourishing mining centres, and are being rapidly opened up with railways. The great want throughout the States is proper labour, which has to be imported. The Chinese are unsuited for coffee work and are very expensive, and the Indian labour, which is now being largely imported, though to a certain degree successful, is, as yet, far from being satisfactory. The yield per acre is simply wonderful if it can only be kept up, but it must not be forgotten that it is the result of virgin soil and soil very rich at that. The elevation of Weld's Hill estates, by the way, is, we understand, about 1,500 feet. A railway runs from Klang on the coast into the heart of the Selangor planting district, with good cart roads branching in all directions so that as the good effects of the virgin soil wear off, fertilisers can be applied at little cost so far as transport, usually about the heaviest item in the expense of manuring, is concerned.

			PRODUCED.
LIN-UM ESTATE, IN SUNGEI UJONG—		Cwts.	Cwts.
In 1884,	28 acres under 4 years old / 12 „ „ 3 „	... 99	
In 1885,	28 „ over 4 „ / 12 „ under 4 „ / 25 „ „ 3 „	... 307½	
In 1886,	40 „ over 4 „ / 25 „ under 4 „	... 369	
In 1887,	65 „ of coffee in full bearing		... 409½
„ 1888,	65 „ „ „ „		... 643½
„ 1889,	65 „ in full bearing		... 732
„ 1890,	65 „ „ „ „		... 692
			2,477
Average per acre for 4 years in full bearing			9½ cwts.
S'LIAN ESTATE IN SUNGEI UJONG—			
In 1885,	8 acres under 4 years old / 28 „ „ 3 „ „	... 92	
In 1886,	8 „ „ 5 „ „ / 28 „ „ 4 „ „ / 9 „ „ 3 „ „	... 336	
In 1887,	36 „ „ 5 „ „ / 9 „ „ 4 „ „	... 238	
In 1888,	45 acres in full bearing		... 495
„ 1889,	45 „ „ „		... 471
„ 1890,	45 „ „ „		... 481
			1,447
Average per acre for 3 years in full bearing			10 7-10 cwts.
WELD'S HILL ESTATE, IN SELANGOR—			
In 1886,	19 acres under 4 years old / 36 „ over 4 „ „	... 325	
In 1887,	55 acres of coffee in full bearing		... 402
„ 1888,	55 „ „ „ „		... 501
„ 1889,	55 „ „ „ „		... 657
„ 1890,	55 „ „ „ „		... 376
			1,936
Average per acre for 4 years in full bearing			8 8-10 cwts.
BATU CAVES ESTATE, IN SELANGOR—			
In 1888,	11¼ acres under 4 years old		... 78
„ 1889,	11¼ „ 5 „		... 72
„ 1890,	11¼ acres of coffee in full bearing		... 131
Average per acre for 1 year in full bearing			11½ cwts.

REMARKS.

Crop was lost in 1884, 1885, 1886 and 1887 from want of labour.

The Crop on Weld's Hill was thrown back by heavy pruning and unsuitable weather for ripening.

The Crops for 91 will not decrease these averages. —*Madras Times.*

THE COMING TEA SEASON.

On the verge of another tea season in China we may fitly look at the position of tea in that country, and its prospects here. A feature of the season now drawing to a close is that, owing to the decreased imports, the larger part of the diminished export from China has gone into use. Another feature is that the wholesale dealers are much opposed to hold stocks of any kinds, so that it has almost become a matter of compulsion for the merchants to hold their importations until the buyers actually require the tea for consumption. For these two causes the coming season will require an unusual amount of care on the par of buyers in China, and also from the fact the stock of tea in this country of all kinds will be reduced to an unusually small quantity—say to about sixteen millions of China tea, which is considerably lower than it has been for very many years, or perhaps has ever been before; and, if the export from the East does not exceed that of last year there ought to be a fair chance of a good outturn; at the same time, if the quantity shipped is in excess of requirements, it will lead to a dragging market. The coming season will also require an unusual amount of care on the part of shippers, because the export having become now so diminished buyers may take a sanguine view of the prospect, and operate more freely than the actual requirements of the trade on this side would warrant. On no account must buyers overlook the fact that they have very strong antagonistic competitors in Indian and Ceylon teas, and it is daily becoming more apparent that China teas are losing their former monopoly of this market, owing to the depreciation in the quality of the various growths imported during the last few years; and in order to compete successfully with its rivals it is extremely necessary for all connected with the China trade to impress upon the grower the necessity of paying greater attention to the manufacture of his produce, and emulate the choice quality which brought tea grown in China so much into public favour. But of this later.

It is in the matter of preparation that we must look for good prospects in Chinese tea, and more particularly would we impress on Foochow dealers to give strict orders as to its manipulation. The slovenly way that they have been frequently prepared and sent forward has done much to account for the great annual decrease which is shown in the export figures. It has been rumoured that a few wealthy natives intend to purchase machinery for preparing tea, and set up an establishment for that purpose in one of the districts around Foochow. How much truth there is in the rumour we are unable to state, but we sincerely hope, both in the interests of the native and European, that the growers and dealers will not go on till they finally extinguish the trade ere seeking, and putting in force, remedies to arrest the decline: They may assure themselves that if they will only make good quality tea that they will be able to make better way against their rivals. China tea cannot and will not be completely driven out; for, given similar quality and price, there still remains a considerable section of the population who will always take it in preference to its rivals. The hardest foes that it has to meet consist of the prejudice against new methods and machinery for the better preparation; but in this way a Chinaman's pocket is being affected, and it may suffice to make him move. But he must move without delay. Foochow only requires a few more seasons of declining exports, at the rate of the last few years, to lose its trade altogether. The North is suffering, but not to the same extent. These better means of growth and preparation, so sorely needed, are even of greater importance than the imposts levied on the article by the Government, which likewise assist to strangle the trade and fetter its competition with the free article in India and Ceylon. Up to two seasons ago China could possibly afford to look on calmly at the diminished export to England, as Russia took what was over. Not so this last season, however, and we trust that now the figures have so materially altered, her foreign advisers will point out to her the double course of less taxation and greater care in preparation. Important as both these matters are, there is no doubt that the second is the more vital.—*L. and C. Express,* March 27.

NOTES ON PRODUCE AND FINANCE.

AMERICAN TASTE IN TEA.—The Philadelphia correspondent of the *Grocer* writes *a propos* of tea:—Cheapness, not quality, is the main consideration. It is incomprehensible—the taste of the American for the bitter, acrid-flavoured Japan tea. More than half the quantity used comes from Japan. We need not look for an increased consumption here until importers bring higher grades of tea, and that will not be done until the retail dealers know more about tea than they now do, and until some pains are taken to educate consumers up to an appreciation of body and flavour.

THAT REMARKABLE TEA.—As a climax to the advertisement obtained by the Mazawatte Tea Company over their purchase of tea at £12 10s 6d per lb., the company invited a number of people to taste the tea on Tuesday. That the infusion of these precious leaves produced a liquid of delicate flavour it is needless to say, but it is equally true that the palate of an expert is required in order to properly appreciate the beauties of this most expensive of luxuries. It is only necessary to say that some of those present declared that the parcel of tea was cheap at the price which was paid for it. The Mazawattee Company have refused to part with their purchase on any consideration.

CEYLON COCOA.—The chairman of the Ceylon Land and Produce Company, writing on the subject of Ceylon cocoa, says:—"It is curious to note that since the year 1887 the price of good red Trinidad cocoa has been gradually declining, from 78s. and 89s. to 66s. and 72s. per cwt., whereas that from Ceylon has been gradually rising from 70s. and 80s. in 1887 to 100s. and 133s. 6d. per cwt. for good red at present. There is no doubt that the beautiful pale chocolate colour it possesses, and its fine mild flavour have been the two principal factors in its being so much appreciated, and its taking the place which the Caracas variety held at one time. With regard to the extension of this product in Ceylon, you are, of course, aware that there is only a limited area where it can be grown successfully; furthermore, it takes from seven to ten years to come into full bearing, so that the present possessors of cocoa estates are very fortunate in getting the current very high prices, and which are likely to rule for some time to come. My company keeps up nearly 1,000 acres." Messrs. Frys, of Bristol, have made a speciality of Ceylon cocoa, manufacturing from it a fine quality of chocolate and chocolate creams. Specimens were exhibited at the Health Exhibition.—*H. & C. Mail.*

VEGETABLE PRODUCTS IN MALAGA.—In a report of the British Consul at Malaga, dated October 13, 1890, it is stated that the Cork, or Cork-wood, as it is generally termed in commerce, which is produced in the province of Malaga, and more especially in the districts of Cortes and Gaucia, in the hill country of Ronda, is perhaps the finest and the best in the world, and is, therefore, eagerly sought and paid for at high prices. The Cork is stripped off the trees every ten years, that being the time required for it to attain the thickness sufficient for the purposes to which it is destined. Last year's production was a short one, as the turn for stripping fell to only a limited number of the plantations. The Vice-Consul at Garruelia says that attention has been paid in that district to the growing of scent-producing plants, and some plantations of the lemon-scented Geranium have been made successfully in Vera and in the Cabrera hills, where an experimental establishment for the extraction of the essential oils has been put up. The climate is specially suited to the growing of such plants aa those just mentioned, as well as Heliotrope, Gardenia, Lavender, &c., and wherever irrigation can be obtained, very large profits can be made in this way. Rosemary, Thyme, and a kind of Lavender (Lavandula Stæchas) grow wild upon the hills in considerable quantities. The Eucalyptus has been introduced for some years, and grows with marvellous rapidity wherever it can obtain moisture. It is sufficiently matured for use in timbering mines at seven years, and if successive plantations of seven sections, say, were made each year, they would begin to yield large returns from year to year after the first seven.—*Gardeners' Chronicle.*

A CHEAP COMPLETE FERTILIZER.—A mixture of acid phosphate, cotton seed meal, and kainit will make a complete fertilizer and of moderate cost, if used in the following proportions to form a ton:

1,200 pounds acid phosphate.
600 pounds cotton seed meal.
200 pounds kainit.

The acid phosphate should run 11 per cent. available phosphoric acid, the kainit should contain 12 per cent. potash, and the meal should contain 8 to 9 per cent. ammonia. This mixture will yield 8 per cent. of phosphoric acid, 1.98 per cent. of potash and 1.08 per cent. of ammonia, which is but a little lower then the average commercial fertilizer selling for $25 and $30 per ton. The ingredients and mixing of the formula should cost not more than $19 per ton, and possibly less, if the ingredients are carefully purhased. You may have to mash up some lumps in the kainit, but both acid phosphate and meal are always in fine condition for mixing. By mixing with hoes on a smooth floor the whole may be rapidly and easily mixed.—H B. Battle. North Carolina Experimental Station Raleigh.—*Florida Agriculturist.*

WHITE PEPPER FOR BLACK.—We mentioned some time ago that a patent had been applied for for converting black pepper into white. The inventor is a Mr. Dunderdale, of Liverpool. The process requires a special apparatus, but, apart from that, the way in which it is done is this:—A liquor of soda ash is made—10 lb. to 1 cwt. of pepper. The pepper is stirred about in the hot alkaline liquor and left to stand until, on trying a sample, it is found that the colouring matter is dissolved off, or nearly so. The liquor which is of an almost inky-black colour, is now run off, and can be utilised for dyeing purposes. To the partially-bleached pepper is added a solution consisting of 84 lb. of chloride of lime to 250 gallons of water. When the seed has been sufficiently bleached this solution is run off and fresh water passed through to wash the pepper, after which the latter can be taken out and dried. It then closely resembles ordinary white pepper. The coloured solution, after being allowed to stand to remove all dirt, is decanted and treated with hydrochloric acid to precipitate the colouring matter, which may be sold for dyeing purposes. [We take this from *Discovery*, which seems to be unaware that black and white pepper are from the same plant.] —*Chemist and Druggist.*

GOVERNMENT RESERVATIONS.—It will be seen by the report of the proceedings of the Committee of the Ceylon Planters' Association that the planters of other districts are endeavouring to obtain from Government the same concessions as regards reserves along the streams passing through their estates that have been accorded to the planters of Udapussellawa. An admission of failure in the object for which these strips of land were reserved having virtually being made in the one case, it may be supposed there will be but little difficulty met with in the case of Ambagamuwa. We are under the impression, however, that the reservations in the one district differs from those in the other to a considerable extent. In Udapussellawa there was a reservation on both sides of the tavalam road that runs through the estates for miles; then there was a reservation along the cart road; and reservations along the course of streams. These different reservations intersected the estates and intersected each other in all directions, and proved extremely vexatious to everybody and the decision of the Government to allow them to be purchased by the estate proprietors has proved very satisfactory. We are not aware of any such network of reservations in Ambagamuwa, but do not for a moment doubt that those along the steams are in their way as vexatious as those in Udapussellawa; but the planters have not quite so strong a plea for their acquisition. That they are utterly useless for the purpose for which they are made we concede, but whether the Government will regard it in that light is quite a different matter.—Local "Times."

"CEYLON AND ITS GEMS."

We should like to know where the "Roving Correspondent" of the *Times of India* whose letter will be found below got his information in respect of the more important part of the information he tenders to his readers. He says that a safe and reliable estimate makes the annual export of gems from Ceylon in value about £10,000; and this, of course, means the annual gathering from the gempits, as very few of the actual finds are permanently retained in the island. The correspondent referred to quite understands that the Customs' returns cannot be at all depended on for the export of precious stones, so many being taken away—like the pearls from our present Fishery—on the persons of the owners, to India especially. In fact the large proportion of our sapphires, cat's-eyes, rubies &c. find their way out of the island without being reported; and we cannot help thinking that the estimate of £10,000 or R100,000 a year is far below the mark.

One test we have which it is surprising the correspondent and editor of the Bombay paper did not apply for themselves. The letter mentions—correctly enough we believe—that before the recent more stringent legislative restrictions, as many as 20,000 natives found employment or were connected with the gemming industry. Certainly this number is not above the mark, if the Rakwana district and province of Sabaragamuwa are considered, and also the Galle, Weligama and Matara districts in the South. Now, without counting the middleman's and exporter's profits, is it likely that 20,000 people, engaged for the greater part of the year in gem digging or hunting, are content with an average return of *five rupees per head per annum!* The idea is absurd. Our contemporary of the *Times of India* ought to have said that not £10,000 or R100,000, but £100,000 or R1,000,000 must, at the lowest, represent the annual find and export of gems from Ceylon, to entice and keep 20,000 Sinhalese more or less engaged in the digging and washing industry, apart from the host of relations, tamby pedlars, jewellers and other middlemen who make a livelihood out of gem selling and buying.

(BY A ROVING CORRESPONDENT.)

Tradition has it that the gemming industry was first established by a peculiar people called "Mookars," who were probably a race of Malabarese. They were under the control and guidance of a woman, called Mookery, and their efforts were so successful that within a short space of time they accumulated a large quantity of treasure, with which they loaded a ship and departed from the Island. But they were not destined to reap the fruits of their toil, for, having incurred the anger of an evil demon, their ship was, by his influence, totally wrecked, and the treasures were washed ashore and deposited anew in various directions. To this the natives attribute the fact that gems are occasionally found in the most unlikely places.

The most valuable gems found in Ceylon, and, particularly in the Sabaragamuwa District, are the ruby, the sapphire, and the cats'-eye—this last much prized by Asiatics and especially by the Malays. Stones of little value, such as garnet, moonstone, tourmaline, topaz, spinel and amethyst are to be had in abundance. The zircoon, in rich shades of brown, violet and green, with its members the grayish white and white jargoon, and the red hyacinth, is found in greater quantities than in any other country. It is here that the unwary globe-trotter has to be on his guard, as with the desire of becoming the envied possesso of a fine diamond or ruby, he not unoften becomes the prey of the designing "Tamby" or Moorman, who palms off as a diamond of the purest water a valueless zircoon, or as a ruby a worthless spinel, garnet, hyacinth or even quartz. It may be noted that a true ruby will scratch any of these counterfeits. Notwithstanding this abundance it is not possible owing to the system under which the industry has been worked to fix with any degree of accuracy the annual value of the gems unearthed. The Customs' registers are not reliable, for out of the many valuable gems found, some are retained in the island, and others are purchased for nominal sums by private persons and speculators, the real values of which are not, if ever known until they are disposed of in Europe or to some of the wealthy princes in India. A rough calculation, however, based on the best available data, gives the value of the precious stones found at about £10,000 annually.

The ruby is of most value, and has at times secured the highest prices. Rejecting as a traveller's tale the assertion of Marco Polo, that he saw a Ceylon ruby the size of a man's arm it may be interesting to recall what is related of another Ceylon ruby, in connection with the part played unwittingly, in the rise of a family that was of note in a subsequent period in the history of the Dutch Republic. A "Chetty" physician became the owner of a large ruby, said to have been the size of a small curry-stuff grinding stone. Cutting it into pieces, and retaining the larger portions, he presented the Dutch Governor of Colombo, Imhoff, with eighteen buttons set with the smaller pieces. Imhoff, not unmindful of gratitude, promptly exalted the donor to the proud position of first Malabar Mudaliyar of the Gate, a title of honour still retained, and about equivalent to a Lord Lieutenancy of a county in England. This rise in rank however stirring into restless action the dormant energies of the Chetty the Governor was at last glad to get rid of his protégé by transforming him into a dignitary learned in the law and presenting him with a seat as Judge of the Supreme Court in Java. This gentleman was grandfather to Dr. Quint Ondaatjee alluded to in Allison's "History of Europe," as the "Great Democratic Leader" &c. Whatever, however the value attached to the Ceylon rubies in the past or the present it should be noted that really valuable ones have ever been scarce and they cannot vie in comparison with some Burmese specimens.

Two of the latter were sent to London in 1875, weighing 37 and 47 1-16 carats. These were reduced after recutting by Mr. J. M. Forbes to 32 5-16 and 39 9-16 carats, respectively, and the former of them was sold for £10,000. What became of them eventually it would be interesting to ascertain, as possibly no single regalia in Europe contains two such fine rubies. Originally they belonged to the King of Burma, but impecuniosity and the chronic state of "hardup-edness" prevailing at that court led to their disposal. This was not an easy matter to achieve, for the people were proud of their possession, and resented the idea of their being sent out of the country. Strategy and military force were brought into play, and with a strong guard and amidst intense excitement they were conveyed to the vessel that was to bear them away to their destination.

In Ceylon, while really valuable rubies are rare, and sapphires common, the converse prevails in Pegu. Still of the sapphires a few splendid specimens have been unearthed, and mention might be made of one in the collection that was sent by the Colony to the Paris Exhibition in 1855, which was valued at £5,000. Notwithstanding the hardness of its nature, the sapphire can be beautifully engraved and in the Cabinet of Strossi in Rome, may be seen one, with the profile of Hercules, the work of Coneins.

The cat's-eye, too, is occasionally of some value, as instance the one that was in the collection of the last King of Kandy, which sold in London in 1820 for more than £400. This specimen measured two inches in diameter.

Though tradition speaks of the "Mookars" as the pioneers of the gemming industry in Ceylon, it is silent as to their methods of work. How far it resembled the practice adopted by the natives at the present time

of which an account is here furnished, cannot be known. The sites selected for prospecting are either the beds of streams or the dry land in their vicinity, and as the gemmer needs but few appliances, he is not handicapped by much initial outlay. These appliances consist of a few crowbars, a few mamotees, a long iron sounding rod, "Illankoore," and a close basket made of split bamboo reeds.

Thus equipped, the gemmer, if the site selected is the bed of a stream, commences operations in the dry season (December to March), when the water is low and sluggish. He first clears the sand away, and from time to time uses the sounding rod to see whether the gravel or "illan," hence the name of the rod, is accessible. In getting to this "illan," the matrix in which the gems are found, his efforts are sometimes retarded by impedimenta in the form of blocks of rocks, and invariably by a sort of crust, called "Cabook" which has to be penetrated, as it is commonly under this crust that the "illan" lies. On reaching this stage, and when the gravel is exposed, the coolies, who have hitherto been assisting the gemmers, are promptly sent away, as none but the initiated and those vitally interested in the success of the undertaking, are allowed to be present at the further development of the search. The gravel is now scooped out by means of the mamotees, and is deposited in the wicker basket, held under water with the feet. The basket thus secured, the "illan" in it is rotated with a quick motion, by which means the clay is dissolved and the lighter particles of stones, and, from time to time, the larger ones, if after due inspection they are worthless, are thrown out. The whole is thus reduced to what is termed "naboca," a thin heavy sand, mostly composed of particles of precious stones, which on careful security are secured.

Much similar to this is the process when the site for search is on dry land near a stream, the season for work being the same. Here the earth is removed to the level of the water, and when it becomes soft, the sounding rod is brought into requisition. So deftly is this used in the hands of an experienced worker, that he is seldom misled as to whether the "illan" is within practicable depth. The result being satisfactory, an anxious moment ensues, for the gemmer has to guard, with redoubled vigour, against an influx of water. The soft sand being removed, the "illan" is readily come upon, should there be no "caboca" to break through, and, by means of the crowbar, it is detached and heaped up for washing, either in the pit itself, if there is not much water in it, or in the adjacent shallow stream. To facilitate labour, the whole of the pit is not gemmed at once. Only one-half of the earth is removed, a flight of steps being constructed in the other half to expedite the removal of the earth and the baling out of the water. This half being exhausted, room is afforded for the earth on its removal from the remaining half, which is then in its turn operated on. The "illan" on being heaped up undergoes the process already described.

Simple and primitive as the process of gemming appears, it is in the majority of instances disappointing in the extreme, when the tangible benefits derived are compared with the great amount of labour involved. The sites and directions in which gems are imbedded are very uncertain and quite unknown, and though in some cases pits are workable in a few days, in others, days, months and sometimes years lapse before the matrix which contains these precious stones is discovered. But the reward of this may not be here, for the matrix may not yield a sufficiency of gems, even of the smallest value, to show a profit or even to cover the expenses. From enquiries the writer has instituted, it may be taken as substantiated, that of every ten pits sunk but one is found to pay. That, notwithstanding these facts, the industry should have been engaged in by the poorer class of natives, shows how hard a struggle for life they had to encounter.

During the reign of the Kandyan Kings when caste prevailed and was rigidly observed, for once a barber always a barber was the rule, the inhabitants of certain villages were exclusively set apart for gemming purposes. A body of hereditary gem men, with two headmen, also hereditary, to superintend the establishment was thus formed. This practice died out on the advent of the more enlightened and liberal British Government, and the gemming industry became open to all sorts and conditions of men.

For the past fifty years, the industry has been pursued by a number of poor people whose sole subsistence depended in very great measure on any little find. Others again, mostly agriculturists, resorted to gemming to eke out what the cultivation of "paddy" did not always afford them, so as to save themselves from absolute starvation. While so affording relief, a system of joint-stockery on a small scale, between expert gemmers and landowners, introducing speculation into it, gradually crept in. In course of time the attention of European speculators, forming themselves into companies, was drawn to it, leading to the investment of larger capital.

Up to the time of the formation of these European companies, the natives were unrestricted in their efforts at gemming, the only places they were not allowed to exploit without licenses being Crown waste lands. The advent of European capital caused the Government to step in, in the early part of last year, with the enactment of an ordinance, that with one fell swoop did away with all the privileges hitherto enjoyed by the indigenous population. The features of this ordinance may be briefly summarised. It enacts that a fee of R5 is payable for a license for every pit opened in *whatever locality*, the number of men employed on each pit being fixed, for each of whom a sum of 75 cents., or 12 annas, for a term of three months is due. A specially hard feature lies herein, for if the number of persons when the license is issued should be 26, and 27 happen at any one time to be employed, the license can be cancelled by Government, and each extra man so employed may be fined R50, or in default undergo six months' imprisonment.

That this is a most unreasonable clause should be apparent to the most unthinking mind, and its execution has had the effect of preventing the poor people to the number of 20,000 from in any way devoting their attention to gemming. It not unfrequently happens that with a sudden influx of water into the pit an increased strength of labour is absolutely necessary for baling purposes if all the efforts already put forth are not to be frustrated. As has been shown, any excess of labour involves a heavy penalty, unless it has been duly applied for and a fresh license obtained, a matter involving a delay of, say, four days, if not more, as a number of formalities have to be undergone, including the drawing up of a report as to the altered circumstances of the pit, by the village headman, an *unpaid* native official.

The ordinance appears to have been drafted on the assumption that the Crown, as successors to the Kandyan Kings, has a prerogative right to gems, *even on private lands*. That such a right was ever exercised by those sovereigns is doubtful, and is not clearly established. It is at all events remarkable that the claim now put forth should have been lost sight of for a long period of years, and that it should now only engage attention.

But not content with these rights, the Government goes further and seeks to establish similar ones on lands which it itself previously *sold expressly as gem lands* for high and fancy prices. These lands were sold outright to the present owners, and that they should be called upon to render to Government a share of the gems found is opposed to every sense of political morality.

Another objection to the ordinance, and a potent one too, as it involves a clear breach of faith, is that the tax is enforced on lands belonging to Buddhist temples, and on the villages of Kandyan Chiefs, who assisted the British power in taking the Kandyan provinces, whereas by law these lands were declared *free* of all tax.

That the ordinance is felt as an extreme hardship by the people, leading them to transmit a temperately worded memorial to the Secretary of State for the Colonies, detailing their grievances, is not to be wondered

at, and sympathy cannot but be felt for them in their attempts to gain redress. The ordinance as it stands has practically killed the *native* industry, and leaves it for the present in the hands of the European speculators who have come on the scene. The *raison d'être* of it really appears to be, that if capital can be invested freely by foreigners, there must be something enormous to be made out of the industry, and so the Government thinks fit to have a share. But the question remains to be solved whether the introduction of European capital, aided by the most improved appliances and the latest methods for working gem mines, will develop into a remunerative business. There is nothing in the past to warrant such a belief, and when it is remembered that gemming has been openly carried out for years, openly and immediately under the eye of shrewd British business men, its success, handicapped as it is by an initial tax of 10 per cent, under the newer auspices, is, to say the least, highly problematic.

Ratnapura and Rakwana are the places where the best gems are found, though along the road I remarked several excavations where gemming had been conducted. Some very pretty moonstones were shown me, which however were of little value. From Palmadale to Rakwana is a distance of sixteen miles up among the mountains. At one side is a deep valley heavily timbered and matted with luxuriant creepers. I noticed some curious orchids, with strange pendulous flowers, hanging from the angles of branches: their stems were covered with fungi of the most gaudy colours —bright red, yellow, and purple. The scarlet shoots of the iron wood tree seemed like flowers in their blood-red hue. Part of the hill side was literally a blaze of crimson, looking as if the wood was strewn with vermilion. This wood abounds with game, wild boar, elk, red deer, black faced monkeys; and the whirr of copper wings indicated flocks of parroquets without number. Rakwana is a mining village, consisting of one long street, and looking absurdly small owing to the presence of some massive iron wood trees and tall palms which dwarf the little huts at their base. No more than 250 families reside here under the shadow of a big brown mountain with huge irregular spurs. Down the side of this mountain trickled a stream which fell over a rough bed of stones in a succession of small cataracts, until it got down to the valley when it slipped along in a placid stream. It looked like a frayed string of braid lacing the side of the huge mountain. One side of the hill was covered with matted jungle and the other placed under cultivation. The view higher up among the glens was inexpressibly fine. The twin wooden shanty of the planter stood out on the hill side, while the green tufts of tea hardly showed on the red brown earth. Down in the valley, the hills appeared like miniature hay cocks, under an amethyst sky of the loveliest blue. The beauty of this scene viewed from the glen where the evening operations take place was lovely, and pathetic in its loveliness. The plaintive note of a bulbul, who is supposed to have a passion for the rose and regrets seeing it plucked, communicated a feeling of sadness to my mind as I looked down from those lofty peaks into the distant valley. There is not a dog hole of the European continent that I have not visited, yet a finer view than the one before me I never witnessed.

The miners are an improvident lot, tunnel diggers getting an average of R2 and a half a day. I had a talk with Mr. Bradley, the Superintendent of the Ceylon Gem Company. and was courteously led round its pits by Mr. J. H. Smart, his assistant, a pleasant, genial, and highly informed gentleman. Here I heard a great deal more of gemmers and their hard lives than I can insert in this article. I trust, however, I have given my readers some idea of gemming in Ceylon to enable them to form a conjecture whether they will find it worth their while to invest their money in such lottery concerns.

Above, we publish a lively and entertaining paper upon "Ceylon and its Gems." Our "Roving Correspondent" seems to have studied the question with some care, but it is startling to learn that according to the best available data the value of the precious stones found in the island does not exceed £10,000 annually. The introduction of the new ordinance or tax has, we are told, killed the mining industry altogether, so far as the natives are concerned, and left it for the present in the hands of European speculators. The question, says our correspondent, remains to be solved whether the introduction of European capital, aided by the most improved appliances and the latest methods for working gem mines, will develop into a remunerative business. "There is," he adds, "nothing in the past to warrant such a belief. and when it is remembered that gemming has been openly carried out for years, openly and immediately under the eye of shrewd British business men, its success, handicapped as it is by an initial tax of 10 per cent., under the newer auspices, is, to say the least, highly problematic." None of our Indian readers are however, at all likely to put their money into the gemming industry of Ceylon, while the grievances of the native miners may be safely left to local public opinion. It is of much more interest to read the words of wholesome warning addressed by our writer to travellers anxious to invest in diamonds or rubies, and to learn what manner of inferior stones are often palmed off instead of them. The safest stones to buy in Ceylon are sapphires and cat's-eyes, but even with regard to these the assistance of an expert is desirable. Considering the thriving business done all the year round at Colombo, and especially with Australian passengers, it is at once a surprise and a warning to learn that the annual value of the gems found on the spot is not more than £10,000. What, we wonder, is the value of the annual sales?—*Times of India.*

LIBERIAN COFFEE AT THE STRAITS.—As already mentioned, Dr. Trimen has returned from Java and the Straits confirmed in the conviction that we in Ceylon have been too hasty in discarding Liberian coffee. In this connection we call attention to a statement and figures in our *Tropical Agriculturist* showing crops in the Malaya peninsula (Selangore and Sungei Ujong) averaging from 8 to 11½ cwt. per acre, returns handsome enough to induce a wide extension of planting. Ceylon has, of course, a far poorer soil, but there are parts of the Western and Southern provinces especially where Liberian coffee might well be planted, by the natives especially, with advantage.

KADIRANA, April 13th.—No shock of earthquake has been felt in this neighbourhood, but thunder-storms and occasionally heavy gusts of wind have been experienced. The north-east is bent upon going out with some bluster. From the 6th to the 10th there was rain in the evenings; the total fall being 2·28 inches. The mornings, are delightful but the days are close and very trying. Growth of vegetation has been rapid for the last two months which will much benefit the cinnamon bushes, and permit of work being begun for the new season (1st May) early. I was much pleased to see Mr. Gladwin's letter, in Saturday's *Observer* on the increase of opium consumption in Ceylon. I have been greatly surprised at the number of opium-eaters I have come across in this locality; and from inquiry I find that opium-eating is becoming common among the Sinhalese. The usual reason given for its use is to relieve aches and pains; and when once taken to, the unfortunate victim has not the courage to give it up. Fortunately in this connection most of the people are too poor to indulge to any serious extent. As in the case of arrack I think the Government is greatly to blame, when, for the sake of a paltry increase to the revenue, it gives encouragement to the extended use of this drug—a boon to humanity when under medical control, but a fearful curse when it can be sold to the ignorant and confiding in the bazaars. These poor people imagine they have found a panacea for their ills, and find when too late that they have only added another and a worse one to the list.

A CUPPING INSTRUMENT FOR SNAKE BITE.

[From a number of the Cape *Agricultural Journal*, we take the following very valuable, commonsense information on the use of a cupping instrument for snake bite. Speedily and effectually applied so as to retract the poisoned blood, no better remedy could be used. In the recent case of poor Bosanquet, in Florida, his companion bravely did his best by sucking the wound. But the venom had got into the circulation through the veins in the *inside* of the foot. Had the bite been on the outside the sucking might have been effectual.—ED. *T. A.*]

Snake poison is now ascertained to be a definite chemical compound, perfectly stable and indestructible, except by anhydrous sulphuric acid, permanganate of potash, and partially by carbolic acid, in fact, by those few substances which decompose and destroy any organic chemical. Ammonia has no effect upon it; for when the poison is mixed with ammonia and injected into the bodies of animal, it retains its energy unimpaired, but it is certain, from South African experience, that ammonia, especially taken internally, probably as a nerve stimulant, counteracts its effects.

There are two kinds of snake poison, the colubrine of the cobras, and the viperine of the vipers or adders. The former is chiefly a nerve poison, and produces paralysis, especially of the respiratory nerves. It kills by causing carbonic acid poisoning, which is accompanied by convulsions. The viperine venom is both a nerve and a blood poison, the latter action being often the more dangerous of the two. The puff-adder is our best known viper.

As snake poison is of this stable and indestructible character, according to the dictates of common sense the first consideration is to get it out of the body, whatever the value of antidotes may be. Dr. Wall, who at the instance of the Indian Government carried out the experiments of Sir Joseph Fayrer to more definite results, is of opinion that nothing will save life in persons bitten by Indian snakes, except making a cut across the side of the bite, and dissecting out the subcutaneous tissues in which the venom is lodged a sixth of an inch or more beneath the surface. Our South African snakes are not quite so venomous, and no one but a skilled surgeon would venture on such cutting and carving. Another plan, therefore, seemed desirable. A good many cases have occurred where life has been saved by sucking out the venom with the mouth. This suction, however, is feeble, and is also highly dangerous if there happens to be any skin wound in the gums or mouth. The proper thing would be a strong cupping instrument. The ordinary cupping instrument is unsuitable, from the glasses being too wide in the mouth. It is also too dear for common use. That of S. Maw & Son London, is 22s. to the trade, and would be at least 30s. retail price. It seemed to me that nothing would serve but an instrument prepared expressly for snake-bite, and sold at about half a guinea. I accordingly induced Mr. William Hume a well-known scientific instrument maker, Lothian Street, Edinburgh, to prepare such an instrument, giving him an exact description of what was wanted. He produced one which is thoroughly effective. The barrel is of brass, about five inches long by ⅞ inch wide, with double valves and a bell-shaped glass ⅝ inch wide at the mouth, and enlarged above so as to hold an ounce of blood. The suction is powerful. A larger glass may also be had at an extra charge, with the mouth an inch and a half wide, for animals. The instrument is sold in Edinburgh at 10s. 6d. What with Customs duty, carriage, and commission it could hardly be sold for less than 15s. in this country, unless an importer were to order six dozen, in which case there would be a reduction of 20 per cent. Still, the price is very moderate, considering that snake-bite antidotes are sold at from 8s. 6d. to 12s. 6d., and are suspected of not keeping.

Treatment of Snake bite.—The thing to be done immediately, on a person being bitten, is to cut off the circulation from the part so as to prevent the venom from being absorbed. The best thing is an india-rubber band or rope, similar to Esmarck's bandage, either solid or tubular, and strong but flexible. This should be wound firmly and a number of times round the limb at the part next above the bite. As this band fits itself to depressions in the bone, it is far more effective than whip-cord even were it made so tight as to cut into the flesh. A soft reim is the next best, but anything, even a handkerchief, should be used in an emergency. The next thing is to probe the two fang punctures with a sharp penknife or lancet. Scarifying is a mistake. It merely removes the superficial blood, while the venom remains lodged in the tissues. The proper thing is to open up the punctures so as to get down to the venom, and secure that it and the envenomed blood is sucked out. The probing being done, the mouth of the cupping glass should be moistened and pressed down firmly over the wound so as to allow no air to get in at the edge of the glass, and the piston worked up and down. The flesh will be sucked in, and the glass will soon be filled with blood. This may be repeated. If the cupping is performed before the poison has gone into circulation, there is every reason to expect that life will be saved. Even if all the poison is not removed, life may be saved, for snake poison does not kill unless it goes above a certain proportion to the entire quantity of blood in the body. The antidote, which should be administered internally at the first, may now be applied to the wound after washing it with Condy's fluid (a solution of permanganate of potash), if it is at hand. * * *

[Then follows a notice of an antidote in the shape of tincture of a herb, the red or wild Dagga, *Leonotis leonurus*, but ammonia alone is probably best.—ED. *T. A.*]

Directions for using the Cupping Instrument.—The instrument should be kept in a place known to all the household, and ready for immediate use. To keep it in perfect order, it should be examined periodically. In testing it, apply it to the chin or any fleshy part. If it does not work that may be from want of oiling the piston, or because the valves are wrong. The oil, should be sweet or olive oil, or else an animal oil, quite free from acid, so as not to corrode the brass. As oil dries up, the oiling requires to be repeated now and again.

To reach the valves, unscrew the milled edge at the lower end of the syringe for the one valve, and screw off the bottom plate of the piston for the other, using if necessary the two small holes to keep the upper part firm. The valves may require simply to be wiped from oil or dirt. If a valve requires renewal, that is a very simple matter. It is a strip of oiled silk (the umbrella article, or that sold by druggists will do) put over a small hole, with its ends tied over a groove in the brass by means of a thread. The packing of the piston can also be easily renewed. It consists of a round piece of leather, steeped in sweet-oil, with a hole in the middle through which the screw of the bottom piston plate passes, and the sides are then folded up—an arrangement easily understood on inspection. The instrument, which is a substantial article, is practically indestructible, and as they are all made exactly alike, glasses and other parts could be replaced for that matter.

The sample instrument in my possession was shown to Sir J. Gordon Sprigg, and as he approved of it, he gave an order home for six dozen. They have probably come by this time, and may be at the disposal of the Colonial Secretary. The intention, I suppose, was to place them in the hands of magistrates or other public officers, so that they might be seen by farmers and others in the rural districts, besides being used. No farm-house should be without a cupping instrument for snake-bite: puff-adders and other snakes are so numerous, and there are so many children, servants, cattle, horses and dogs liable to be bitten. The cupping glass will also be serviceable for the sting of the scorpion, the bite of the tarantula, the stings of wasps, and if applied at the moment, for poisonous blood or matter getting into a scratch.—ANDREW SMITH.

NOTE.—The cupping instruments have come, and a set will be sent on application to any Civil Commissioner or qualified medical practitioner. I may add that it has for a long time been my habit, in travelling, to carry, in my pocket, a small glass funnel for use in sucking the puncture in case of a snake bite. This, of course, does not act so powerfully as a cupping instrument, but has the advantage of being small enough to be easily carried in one's pocket.—EDITOR.—*Agricultural Journal.*

POULTRY NOTES.

Change the straw or hay in the nest boxes frequently.

In shipping fowls give them plenty of room, but make the coops as light as possible. Express companies have no souls and rates are high, and all we can do is to protest and pay.

It is only necessary to examine a chicken's crop to ascertain that a good variety of food as well as bones or gravel is essential, and ordinarily a good supply of a variety of food will be found much better than any kind of medicine.

Bran is excellent for poultry, but the hens care but little for it unless scalded. To make it "stick," and a handful of linseed meal to every point of bran. The two substances are an excellent combination, and will greatly aid the hens in producing eggs.

Do not be tempted to keep a cock that is not a thoroughbred, or that is related to the hens, no matter how promising he may seem. Change the cocks every year, and the flock will gradually improve in vigor, resulting in a greater number of healthy chicks, as well as an increase in the supply of eggs.

The coarse grain so universally fed to poultry is both expensive and unprofitable; being swallowed hurriedly and often in unwise quantities, it frequently produces indigestion or other serious disorders. A mixture of four parts of wheat bran to one of meal is what I feed, with signal success and satisfaction to both laying hens and growing chicks.—*Florida Agriculturist.*

ORCHID HUNTING

appears to be a fine adventurous sport—not so exciting, perhaps, as Waterton's snaring of the caymans with baited hooks in the great rivers of Brazil, but getting on that way. Unfortunately, the most prized of our orchids are reported to be rapidly disappearing from their native places. According to the "Journal des Orchidées," in the environs of Pacho (Ecuador), where hundreds of thousands of specimens of the *Odontoglossum Alexandræ* have been collected, only a few plants are now left. In other places where it once flourished, it has entirely vanished. Though not in the true sense of the word a parasite, this beautiful plant prefers to grow upon the trunks of trees, which the natives dread to climb on account of the scorpions and stinging ants. Hence the practice is to fell the huge tree, with the frequent result that no orchid is found. The hunters, it is stated, separate into parties of five or ten, and disappear for a fortnight in the dense South American forest, relying for food in great part upon their guns, and sleeping at night in hammocks. When sufficient specimens have been collected they are cleaned, wiped dry, placed carefully in crates on the backs of mules, and thus carried to the point of embarkation—Honda—on the river Magdalena. The journey occupies at least five days, even if the party are lucky enough to escape the frequent tropical rains which convert peaceful brooks into raging torrents. Sometimes it is found necessary to throw temporary bridges over these suddenly swollen water-courses and to carry the crates across by hand, while the mules, relieved of their burdens, swim across as they best can. The withering torrid heat is the greatest difficulty.—*Public Opinion.*

PADDY AND DRY GRAIN CROPS IN CEYLON.—From the Abstract of Season Reports for March 1891, published in the latest *Gazette*, we learn that in the Colombo district the condition of the paddy crops was good generally, with the exception of portions of Siyane Korale West, where recent rains had done some damage. It is also stated that "there is no distress or want of food anywhere, and the health of the district is on the whole good." In other parts of the Western Province also the prospects were favorable. In the Central Province, on the other hand, the paddy crops in the Kandy district were reported as generally poor; while the kurakkan crop, where cultivated, was only fair. In the Matale district, however, the paddy crops, where they were in existence, were "much benefited by recent unexpected rains." In the Nuwara Eliya district paddy and kurakkan were only fair or poor, owing to poverty of soil and drought, except in Kotmale, where the paddy crop was good. With regard to the Northern Province, the report from Jaffna on the paddy crop was:—"Reaping throughout district completed. Crop on the whole good, though there has been failure in some villages as already reported." And on kurakkan:—"Good crop expected owing to benefit by rain." It was also added:—"Tobacco in some places cut—prospects of a very good crop." From the other districts of this province the reports were not very satisfactory; the dry grain crops seem to have been better than the paddy. In the Southern Province good showers had fallen, and the prospects generally were favorable. From the Batticaloa district of the Eastern Province it was reported:—"Prospects of grain crops most favorable. Harvesting of early munmari proceeding, and very extensive cultivation for kallawellamai in progress. The new paddy one rupee per bushel. Supplies of vegetables and Indian corn abundant, and cheap. Indian corn 75 cents per bushel. Manioc unsaleable though offered at 50 cts. per cwt. Plenty of water in tank, and rain at intervals." In the Trincomalee district progress was slow on account of cattle murrain. In the North-Western Province rains had fallen, but too late to do much good, except in the Wanni and Chilaw. The tobacco crops in the latter division were excellent. From the North-Central Province the report was: "Partially distributed rain filled some tanks in east, west, and south of Nuwarakalawiya. Maha crop nil owing to drought, except in Kalpe korale and a few villages of Nuwaragam palata. Chenas partially revived by recent rain. Kurakkan crop generally middling. Abnormal rainfall in Tamankaduwa. Maha crop, where cultivated late, good. Chenas average half crop, and being reaped. Drinking water bad, and scarce in many villages." In the Badulla district of the Province of Uva the kurakkan and Indian corn crops were fair except in Buttala, where excessive drought had made the hên poor. In the Province of Sabaragamuwa the crops and prospects were generally good.

THE JAMAICA EXHIBITION:

WHY NOT A COSMOPOLITAN EXHIBITION IN CEYLON?

(*From the Hills.*)

It is surely curious that while it is now about a week since the special illustrated edition of the Jamaica *Gleaner* reached here, with a full account of the opening of the Exhibition at Kingston by Prince George of Wales, as the representative of his royal father, the Prince of Wales, no notice of the event has as yet been taken by the English press, judging from the negative evidence of extracts in the *Tropical Agriculturist* at any rate. You are, no doubt, waiting for the promised account by Mr. Wm. Sabonadière, the only mention of whose name in connection with the ceremonies and festivities is the statement that, at a grand fancy ball given by Sir Henry and Lady Blake, he appeared in the character so dear to juveniles, of Santa Claus. The Governor himself appeared as Columbus, the discoverer of the Caribbean Island, while Lady Blake personated Queen Isabella, to whom the great navigator wrote such a glowing although not an exaggerated account of the beauty and natural resources of his discovery. At the ball the Governor is described as specially seeking out a lady, Miss Espeut, who, he understood, appeared as Jamaica. Some of the portraits given by the *Gleaner* are fearful and wonderful. For the males it does not so much matter, but we hope less than justice is done to the accomplished Lady Blake. She is sister of the Duchess of St. Albans and daughter of the late Mr. Bernal Osborne, famed for his caustic wit, which was so irrepressible, that, when he took office, he could not refrain from using it at the expense of his colleagues, and so had to resign. Jamaica has to thank the snobbishness of the Queensland democracy, who protested against a Governor who began life in the Irish Constabulary, for being at present ruled by one of the ablest and most active men amongst the list of Colonial Governors. He has worked incessantly to make the Exhibition a success, not only as a spectacle, but as a means of making the colony and its productions better known and so increasing its commerce. The only unpleasant incident we see noticed is in connection with another exemplification of the fact that democracy can degenerate into snobbishness. Mr. Blaine, who does the offensive policy of the United States, pretended that his country had been slighted because not specially invited to take part in the Exhibition. Sir Henry Blake showed that precisely the same invitation went to the United States as to all other countries. But this does not content the blatant Blaine, whose every effort is directed, by means of tariff distinctions, to force Canada and the West India Islands into "the Union." Although Sir Henry Blake is not himself a lord, and was, therefore, unacceptable to the Queenslanders, his Private Secretary is Lord George Fitzgerald, brother of the Duke of Leinster. The *Gleaner* describes the Exhibition as "a splendid success which will inaugurate a new era of advancement and prosperity for Jamaica." There is room for improvement, for the journalist states:—"In manufactures and even handicrafts our people are very children. In agriculture we are little further advanced than we were two hundred years ago. Literature, Science and Art are unmeaning words to 999 out of every thousand amongst us." It is added:—

One good at least, if none other, the exhibition should do and that is to give the lie to those unworthy sons and residents who are perpetually decrying everything of home growth, believing in nothing that is "creole" and taking a strange pride in uttering their loud contempt of everything Jamaican. The motto of these people has always been that nothing good could ever come out of Jamaica. They have preached it from pulpit and from press, they have dinned it into the ears of foreigners, taking as strong a delight in shewing up the weak points of the people and the country as some people do in harping on their own maladies or as a Neapolitan beggar in displaying his festering sores. The Exhibition will prove these people to be miserable carpers. It will show our own people what can be done in Jamaica by persistent energy, by united effort. It will nerve many to other achievements longed for for many a day but looked on as almost hopeless of attainment in Jamaica. If a great World's fair is possible in Jamaica, why not docks in Kingston Harbour? Why not a seawall on the harbour front? Why not nicely paved streets with commodious sidewalks? Why not a thorough system of drainage? Why not central factories? Why not smiling vineyards? Why not a network of railways over the Island? Why not in short a thousand and one things that we have been slumberously content to do without, while the great nations of the earth have for years past looked upon them as necessaries of life?

Now if a World's Exhibition has been a splendid success in little Jamaica with only 600,000 of population, and most of them only emerged from slavery, surely the question arises and ought to be answered, why Ceylon, with her three millions of population, her central position in the eastern world, and her grand harbour, the resort of mail and merchant ships, with passengers and tourists from all parts of the world, should not attempt an Exhibition of her own, inviting all the countries and peoples of the world to take part in it? Will the glory of having initiated, matured and carried to a successful issue so great and so undoubtedly beneficial a design fall to Sir Arthur Havelock? Will our Governor do for Ceylon what Sir Henry Blake has done for the tropical island of the western hemisphere? There is more good work to be done and more of legitimate fame to be earned in carrying out such a design than in tampering with sources of revenue, prescriptive in their nature and, however objectionable in the light of western ideas, quite consonant with eastern customs and eastern notions.

The Ceylon Exhibition, if carried out, could so precede the great World's Show at Chicago that most of the exhibits might be transported to the western world, after having done duty here. The effect on our staple product of asking all the world to come and see it in the place of its origin cannot but largely help the efforts that are made to render it acceptable by sending specimens to the various countries of the world. Submitting the idea to readers of the *Tropical Agriculturist* from the Governor and Lieutenant-Governor downwards, we proceed to notice a few further points of interest connected with the Jamaica Exhibition. The only qualification noticed in connection with the opening of the Exhibition is the comparative failure of the electric light contractors to illuminate the building fully at night. Besides the great domed building, there are 23 acres of grounds laid out with tropical and other plants. Canada, which is competing with the United States for the trade of the West Indian Islands, occupies a commanding position in the collection of exhibits. A trophy of the finest woods of Quebec, in the form of a castellated wall, had to be erected in the grounds, as it was too large for the interior of the building. Admiral Watson and the officers of the British Fleet which accompanied Prince George added greatly to the effect of the show (the warships were

lluminated at night); while Major-General Clive, Justice and the officers of the Army, Militia and Volunteers were not behindhand. Limited as spacein the *Tropical Agriculturist* is, we must make room for the following editorial remarks: —

When the public look at the diagram exhibited by the Jamaica Institute, showing the cane lands cultivated in 1790, the chief of the so-called "palmy days" of old, and turn to the companion diagram showing the cane lands cultivated today, they will see some reason for writing of a *new* Jamaica. Whether a better or a worse is not the question. When they turn to another diagram showing the extent of the small holdings at this date, and remember how few they were a century ago, they will be still more convinced that the Jamaica of today is a very different thing from what it was. When they turn again from these things to the educational and other statistics that indicate material, intellectual, and moral advancement, they will have before them proofs of a change amounting to a revolution that has not been all the circumstances considered, anywhere exceeded within the same number of years. It would be easy to point out in history many great and remarkable changes, but these who try will find it hard to point out one that exceeds in interest what has been effected here. It took that master lawgiver Moses more than his own life-time to build up a nation out of the oppressed Israelites. He did, however, good and lasting work. He made a people as enduring as granite. The modern lawgiver, the British Parliament and Executive, instructed by the British People, did a similar creative work, when during fifty years previous to emancipation they abolished the Slave Trade and watched jealously and carefully over the rights of the slaves, and when for the fifty years that followed they watched with equal care over the interests of the emancipated people. The result is the strong, growing *new* Jamaica that has made an Exhibition possible here, and is going to make it a success. This newness, with its assured continuance, is the great fact that should attract the attention of our more thoughtful visitors.

There is another new thing connected with Jamaica. The character of its scenery is not new. So far from that, it is as old as the hills. But the recognition of it and of the character of the climate is new. As Sir Walter Scott was said to have discovered Scotland in respect to scenery, so recent travellers have been discovering the truth, of the Governor's words, that Jamaica is one of the loveliest islands in the world.

What is anticipated for Jamaica might well be realized in the case of Ceylon, in the resort of visitors who desire to escape from depressing cold to genial warmth: —

If those who have eyes to see and natures fitting them to enjoy what is beautiful in scenery will in twos or threes make a leisurely journey from Kingston to Lucca *via* Ewarton and by way either of the interior or the coast road, they will see in this month of January what will astonish them if they come from cold and leafless England or Canada. To transport in a day or in fourteen days a dozen Englishmen or Canadians to St. Ann's, Trelawny, St. James, or Hanover as they now are, would be a great surprise to people who think of us as sweltering under tropical heat, surrounded by parched fields, and hardly able to bear up under the burdens of existence. They find themselves in a garden, driving along main roads as smooth and pleasant as any in the world, where the scars made by pick-axe or shovel are soon healed, and nature all round wears a robe of riches and most varied green, and where the forms as well as the colours of plant life are strikingly attractive and beautiful. When they thought of what they had left behind of the cold and the nakedness of the land, of the struggle in the part of thousands to keep up the fire in the "living stones" which every animal body is, they might well think that they had come to winter in paradise. The thought would be literally correct. Some of our present visitors will, when they go home, say so, and come back often and send others.

CEYLON PLANTERS' AMERICAN TEA COMPANY.

TRANSFERENCE OF BUSINESS.

THE TRADE WITH AMERICA.

At noon of April 9th, a meeting of the Ceylon Planters' American Tea Co., Ld. was held in the registered offices of the Company (Darley, Butler & Co.'s) 9, Queen Street, Fort, Colombo. Mr. L. H. Kelly presided, and the others present were the Hon. J. J. Grinlinton, Messrs. V. A. Julius, A. H. Thompson, E. B. Creasy, H. Whitham, J. F. Headrick and W. W. Mitchell, by his attorney Mr. J. F. Headrick. Mr. Grinlinton had proxies from Messrs. G. Ross, Le Vallon, Pussellawa, and James Westland, Gammadua, Rattota. After the approval of the minutes of the previous meeting,

Mr. KELLY explained that at the last general meeting it was decided by the shareholders present that the best course they could adopt was to accept the arrangement which had been made by the Hon. Mr. Grinlinton on behalf of the Ceylon Planters' American Tea Co. with the new Company in America—the Ceylon Planters' Tea Co. It was thought most advisable that they should hand over their old Company to this new Company who were prepared to undertake it. That was the feeling of the shareholders at the last meeting, and it was then left to the directors to arrange all the preliminaries. The directors had done so, and this meeting had been called to endorse their action, to declare the winding up of the old Company and hand it over to the new Company. The shareholders were perfectly well aware of the reasons which had necessitated this step, and he could only hope with his brother directors that the step which the shareholders had taken was a wise one and would not only lead to the furthering and pushing of Ceylon tea in America, but also turn out a profitable speculation for those who are interested in it. (Hear, hear.) After reading the formal resolutions which it was necessary to pass, Mr. Kelly proceeded to say that the directors this morning went through the list of defaulters and had decided to forfeit the shares of those who had not paid up. Where, however, the slightest doubt might exist in the case—for instance, of men absent from the country—the directors had arranged to give these men a certain amount of time because being absent it was just possible that the notices had not reached them. With regard to the arrangement made by Mr. Grinlinton that interest at 9 per cent should be paid up to 1st October 1890, the directors had arranged that the interest should be paid at once, and would be paid forthwith. In answer to a question he said the only difference in the name of the new Company compared with the old was that the word "American" was left out.

It was then unanimously agreed on the motion of Mr. CREASY seconded by Mr. JULIUS:—"That the Ceylon Planters' American Tea Co. Ld. be wound up voluntarily."

Mr. THOMPSON moved and Mr. WHITHAM seconded: —"That Messrs. J. J. Grinlinton and James F. Headrick be appointed liquidators of the Company, and that their remuneration be at R500 each."

Mr. KELLY pointed out that the offices of the Managing Director and Agents and Secretaries would cease as soon as the Company ceased to exist, but a very large amount of work would remain to be done in the way of settling matters generally, and remuneration to the gentlemen who did it was a matter of course. They could not expect them to undertake the work of winding up the Company and all the trouble connected therewith, without giving them remuneration.

The resolution was adopted unanimously, as was also the following one, which was proposed by Mr. CREASY and seconded by Mr. THOMPSON :—"That the assets of the Ceylon Planters' American Tea Company, Ld., be transferred by the liquidators so appointed to the Ceylon Planters' Tea Company in terms of the agreement of the 15th Sept. 1890."

The Hon. Mr. GRINLINTON suggested that the quantity of tea sent out might be mentioned.

Mr. KELLY said that since the Ceylon Planters' American Tea Co. had been set on foot and working it was satisfactory to feel that they had been doing something at any rate towards advertising Ceylon tea in America. From the date they commenced sending out tea up to the present moment they had sent 70,146 lb. ; and although that might appear a small amount for so large a Continent, it must still bear some fruit. It was quite evident that 70,146 lb. of tea sent to America must make Ceylon tea known to a very much greater extent than it was before, and they could only express the hope that it would do so. Direct information had not been received from the American Tea Co., but indirect information which he had, rather from London sources than here, was that the Company in America were extending their agencies considerably and hoped to do a very good business in Ceylon tea.

The Hon. Mr. GRINLINTON added that the figures quoted by Mr. Kelly showed only the quantity of tea that was sent direct from Ceylon and did not include the quantity sent from the London agents of the Company of which they had no record at present.

Mr. CREASY believed it was in the power of the directors to have enforced the calls on the shares that had now been forfeited.

Mr. KELLY said he would leave Mr. Julius to speak as to that.

Mr. JULIUS said that notwithstanding the forfeiture of the shares it would be seen by the articles of association that the shareholders were still liable. In section 33 it was stated—"Any shareholder whose shares have been so declared forfeited shall notwithstanding, be liable to pay, and shall forthwith pay to the Company all calls, instalments, interest and expenses owing upon or in respect of such shares at the time of the forfeiture, together with interest thereon from the time of forfeiture until payment at 9 per cent per annum ; and the directors may enforce the payment thereof if they think fit."

Mr. CREASY queried :—But the Company being now at an end they will not now be liable ?

The CHAIRMAN :—Oh ! yes.

Mr. CREASY :—Although the Company is now dissolved ?

Mr. WHITHAM :—The liquidators have power to enforce it.

The Hon. Mr. GRINLINTON :—But would it be judicious ? Might not the forfeiture of shares be absolutely sufficient punishment ? He did not know any Company—and he had known a good many in Ceylon—having a case in which they sued a shareholder for the balance of his shares ; they had contented themselves with the forfeiture of the shares. It was a question for their consideration, however, and as one of the liquidators he should be glad to hear their views on the subject, but if it were left to the liquidators they should try to recover as much of the money outstanding as they could recover.

Mr. CREASY remarked that much inconvenience was caused by people putting down their names and not paying up.

The Hon. Mr. GRINLINTON :—I agree with you. It is not at all right, and I am sorry to see that so many persons who ought to have known better should do so.

Mr. KELLY did not think it would be advisable to go to extreme measures. They did not give up their powers until the meeting confirming the present meeting, so that it would still rest with them in any case where they thought it necessary or advisable to push matters to the extreme.

Acting upon the suggestion of the Hon. Mr. Grinlinton, Mr. Kelly intimated that it was intended to hold a general meeting to confirm what had been done at this meeting on Thursday, 28th May, at one o'clock, when he trusted there would be a larger number present than there was today.

This was all the business, and the meeting separated after according a vote of thanks to Mr. Kelly for presiding, on the motion of Mr. Thompson.

SALE OF FORESTLAND.

Mr. E. John sold on April 9th all that allotment of land No. 6, at one time forming part of Mooloyakelle estate in Upper Hewaheta, in extent 180½ acres, of which 27 are planted with tea, for R12,100 to Mr. J.G. Wardrop who bought on account of Mr. R. J. d'Esterre who owns the adjoining property.

CROWN FOREST AND CHENA LAND FOR SALE.

Some 17 lots from 17 to 186 acres each in Bambarabotuwa division of the Province of Sabaragamuwa are to be sold early in June. Full particulars will no doubt be advertised in good time ; and as tea land is so much in demand, an advertisement with details should appear in our "Overland" papers for home capitalists to see.

LIBERIAN COFFEE CULTIVATION IN THE STRAITS.

The English mail of April 14th, brought us a letter from Mr. Thos. H. Hill, formerly well-known as a Matale planter, and a careful experimentalist with new products at a time when coffee *Arabica* was still all the rage in Ceylon. Mr. Hill had long promised to give us the results of his experience as a planter in the Malayan peninsula, and the letter which will be found in our *Tropical Agriculturist* (on page 805) is, he says, the fulfilment of this promise. He sent his manuscript however, first to the *Singapore Free Press*, so being enabled to send us a proof copy. Perhaps the most interesting portion of Mr. Hill's compilation, in the estimation of practical planters, will be the figures showing the actual crops of coffee gathered for a series of years off separate fields at different ages of several Liberian estates. Curiously enough we were able to lay this return before our readers (see page 789) and to comment upon it some days ago, through its publication first in the Madras press. Possibly Mr. Hill had supplied a copy of his statistics to some Anglo-Indian visitor, and indeed the results are so good in average returns of from 7 to 11 cwt. of coffee per acre that Mr. Hill may well be ready to proclaim them from the house tops. With such figures before them intending coffee planters and investors will read with special interest Mr. Hill's remarks under the various headings of nurseries and selection of seed, of soil, climate, &c. There can be no doubt of the encouragement offered, nor of the fact that

the different Straits authorities (central and local) profiting by the past history of Ceylon, are most anxious to encourage and aid as far as possible, *bona fide* planters and capitalists in taking up land for Liberian or Arabian coffee and allied products. Mr. Hill does not say so much in respect of labour supply as we should like; but a curious statement is appended without comment, with the chief heading "Labour," entitled "Return showing the total expenditure on Public Works in the Colony and the Native States" during the ten years 1880 to 1889 inclusive. We do not publish this table, but it shows a very large expenditure indeed, the total (for Singapore, Penang and Malacca, under 'Colonial Government' and 'Municipalities' and for the native States of Perak, Selangor, Sungei Ujong, Negri Semblan and Pahang,) rising from 659,433 dollars in 1880 to no less than 3,483,743 dollars in 1889. Turning these into rupees, we get an expenditure of about 7½ millions of rupees on *Public Works* in one year which is very large indeed. We suppose a great part of it must be out of loans, rather than current revenue, and for railway extensions?

But now what object can Mr. T. H. Hill have in appending such a tabular statement to his planting letter and heading it "Labour?" Does he want to show that the States include a very large labour force accustomed to public works and who are likely to help the planters as the Governments slack off in their requirements, or is his object to show how well the country is being opened by roads, bridges, railways, &c. Anyhow, there can be no question that the Malayan peninsula under enlightened administration is being rapidly developed and that there is much encouragement to capitalists interested in coffee and other tropical products, to look to that quarter for investments.

THE POSITION OF TEA.

Discussing the outlook in tea from the wholesale and retail dealers' point of view, the *Grocer* says:—"The general statistical position of this article remains very strong, and the only element of weakness in it is the refusal of the trade to go on buying as freely as they did when prices were 1d to 1½d per lb lower than they are now. Many dealers and others, having well supplied themselves with available stocks, can afford to await the development of events, and while they keep out of the market as leaders of speculative operations the upward movement in quotations is likely to receive some check. The pauses that have occurred at one time and another since the big rise that was established about a month ago, have exercised a wholesome influence on the market, in preventing it from acquiring too confident an attitude, and in restraining both speculators and the more sanguine, not to say reckless, portion of the trade from carrying their ideas of value beyond reasonable limits. Although a material advance in the value of tea has ensued since October last, it must be remembered that it took place on prices which had been at an unprecedentedly low level, at least as far as China descriptions were concerned, and a seasonable rally in prices is not calculated to do much, if any, harm but rather the contrary; as to allow an important article of consumption to become too depreciated for either growers or capitalists to take a lively interest in it is to hinder production and prepare the way for still greater scarcity than may actually exist; whereas to urge in a legitimate manner the trade and consumers to pay a trifle more money as a gentle stimulus to turning out increased supplies is to insure future abundance and guard against the sudden alarms and surprises that grow out of real or imaginary deficiencies long before they are fully realised.

Viewed collectively and in their broadest light, and taking one kind with another, the clearances of tea in London since January 1st show a decided increase over those in the two previous years, while the stock, owing principally to the serious deficit in China makes, was about 18,000,000 lb. less than in 1889, and nearly 15,000,000 lb. below that in 1888, so that, with much more moderate estimates of the Indian crop for 1890-91 than originally formed, the immediate outlook for those whose purchases are dependent on easier prices being established soon is not of a very promising nature.—*H. & C. Mail.*

CEYLON PRODUCTS: PRICES AND PROSPECTS.

An experienced Ceylon planter who travels a good deal, writes:—

"Certainly *Tea* is coming to the front. Tea planters made a mistake in estimating results from young tea too highly, but I believe they have underestimated the yields of tea after it reaches 6 years.

"*Cocoa* under good shade looks now as if it would have a more extended area of growth than we were inclined to estimate up till now. Since my return I have seen very excellent results on what seemed two years ago barren cocoa by the successful planting of good shade.

"*Prices of coffee* I fear must go down 15s to £1 in value if we are to judge by the clearing-house returns for prospective deliveries. (See Rucker & Bencraft's Coffee Circular of the 19th March.)

"The favourable rates of *Exchange* enable us to meet lower prices which must prevail now that Ceylon *Tea* export in 1891 is to be so far ahead of 1890's. India will probably do better than last year, and China teamen will make an expiring effort this season, the last flicker of the lamp!"

RICHNESS OF LOUISIANA SUGARCANE.

(*From the Hills.*)

In the *Louisiana Planter and Sugar Manufacturer* of March 7th, published at New Orleans, there is no allusion to the lynching case, but our attention has been arrested by an article on the results obtained by the Caffery Central Sugar Factory in 1890-91. Every possible chemical detail is given, but the general results showing the richness of the canes in saccharine matter must suffice, thus:—

Cane ground, tons, 32,180; pounds, 64,360,000. Sucrose, per cent. of cane, 12.01. Sucrose, per ton of cane, pounds, 240.2. Total sucrose in cane ground, 7,729,636 pounds. Fiber, per cent. of cane, 11.02. Juice per cent. of cane, 88.98. Juice extracted, gallons, 5,433,881; pounds, 48,361,540. Juice extracted, per cent. of cane, 75.14. Per cent. sucrose in raw juice, 13.50. Total sugar extracted, 6,528,808.

Total commercial sugar made and estimated, 6,142,800 pounds; total commercial sugar per ton of cane, 190.88 pounds; sugar made from outside syrups, 650,000 pounds; total sugar made, 6,792,800 pounds.

RESULTS.

	Per cent. of cane.
First sugar of 100 polarization	6 80
Second sugar of 100 polarization	1.74
Sugar in third masse cuite	1.25
Sugar lost in bagasse	1.86
Mechanical loss and by inversion	0.34
Loss not accounted for	0.02
Sugar, per cent. of cane	12·01

It would thus seem that the sugar in the canes was equal to 12 per cent, against 10 to 11 in Queensland and only 8 in Ceylon; but the loss having been 2 per cent, the final result in sugar was 10 per cent of the weight of the canes, about as good a result as can be expected. We suppose. "Except in Peru," we ought to add, if dependence can be placed on the figures given in an article on "The Varying Saccharine Content in Tropical

Cane." From this article I quote as follows:—

Past experience and observation has taught that canes planted in virgin soil after the removal of the forest growth yield an abundant tonnage, with a low sucrose content as compared to those planted in land which has long been under cultivation. Climatic and other conditions cause a variation in saccharine strength in the juice of the cane from about 5 per cent. to as high as 22 per cent., which has been noted in Peru. According to M. Maumené (page 80, vol. 2), the percentage in the beet ranges from 3 to 18, and it is with the beet as with the cane, a heavy tonnage and a high saccharine content are incompatible. The quality of the soil is an important factor in the cultivation of the cane and beet, as it is admitted by high authority (M. Maumené) that "the chemical nature of the soil is entirely secondary; it is above all the physical texture and the corresponding absorptive powers which are of great advantage."

Excessive tonnage is produced by an undue amount of nitrogen or ammonia in the soil, and such must be carefully avoided whatever its source. The amount of ammonia in the annual rainfall varies much according to locality. Sir J. B. Lawes, of Rothamsted, England, found almost exactly one part in a million of rain, M. Boussingault in Alsace found ⅘ of that amount, and M. Barral nearly 3½ parts in a million of rain water of Paris, France. This source of supply is inadequate for full plant development as proved by analysis, and from whence the balance is derived by the cereals remains for science to divulge, yet the microbes which are supposed to supply the nitrogen in the growth of leguminous plants may in a lesser degree promote that of the grasses. In the production of grain it has been found that it takes over five pounds of ammonia to produce a bushel of wheat, and its equivalent of straw. Such valuable data to the farmer is had by direct field experiments, and it behoves those largely interested in the production of sugar to inform themselves as to what quantity of ammonia is required to produce a ton of cane, and the amount which can be used per acre, and not decrease the subtile element, saccharine, contained therein. The importance of field experiments cannot be too highly esteemed where it becomes almost imperative to produce maximum yields at minimum cost for field manipulations and manufacture.

So high a percentage of sugar as 18 in beets is probably due to free applications of nitrates. But beets seem in danger of destruction by a nematoid worm, as shown in an article from which the following is quoted:—

Mr. George Dureau, editor of the *Journal des Fabricants des Sucre*, has favored THE PLANTER with a copy of his recent pamphlet on the *nematode* or worm that has been found to be the chief cause of the seeming deterioration of the sugar beet in France and Germany. This worm penetrates into the beet roots, lives on their juice, accomplishes its metamorphoses there and multiplies with such frightful rapidity as to promise to render beet culture ruinous and finally impossible. For a long while the existence of these parasites was unknown, and it now promises to injure beet culture as the phylloxera has the culture of the vine. It was thought in Germany, that the reduced yield of beets was caused by the impoverishment of the soil from the too frequent planting of beets in it, and they designated this phenomenon as *fatigue betteraviere*, or *beet sick*, if we may utilize the analogy of *clover sick*, a phrase frequently applied in this country to clover lands similarly affected.

A careful study of these phenomena, made by a distinguished German Professor Julius Kuehn, has established the fact that there is no real exhaustion of the soil, and that the beet crops were reduced by the presence of numerous worms in the small, fibrous roots of the beet, and that, their destruction accomplished, the fields resumed their former fertility and gave as abundant yields as ever before.

The presence of the sereh in the sugar cane of Java, and of the nematode in the beets of Europe, show how insect or fungoid life is struggling against these two great crops, and here in Louisiana we are sometimes led to think that we may have exceptional advantages for the production of sugar from tropical cane from the fact that our cold winters destroy so many of those insect enemies that do immense harm in the tropics.

WHAT QUININE REQUIRES

is a Beecham or a Sequah, who will take it by the hand and lead it forth disguised as the latest elixir of life, who will blare forth its all-curing properties with brazen impudence and trumpets of brass, who will preach it forth as the only perfect panacea on mountain-side, on city-walls, in books, in papers, in all countries, and in all tongues. This has been done to a very large extent in the United States, with the consequence that half the world's supply is consumed there, although fever is not more prevalent than in Europe, nor nearly as much so as in Asia or Africa. Until the drug is well advertised, it will be driven out of the field by patent medicines, not one quarter as beneficial. It must be advertised, but in the meantime we again urge on Government to do all that lies in its power—and it can do great deal with the help of its hospitals, its vaccinators and the headmen of the villagers—to make this drug popular throughout the Peninsula—*Madras Times.*

TEA-MAKING EXTRAORDINARY.

Mariawatte tea fields with their steady average of 1,000 to 1,100 lb. of made tea per annum for several years, have accustomed us to great things in Ceylon and we hear occasionally of fabulous quantities of green leaf being plucked per cooly. We have also the case of the Ruanwella estate that made 300 lb. of tea per acre in one month over a twelve acres field; and we have heard of a well-known Kelani Valley plantation which has given over 7,000 lb. made tea per week for as many as 10 weeks together at a time. But the news we have just heard of Bandarapola, Matale—in rather dry situation—seems to put all these in the shade, for Mr. Fraser has taken in leaf equal to 10,300 lb. a of made tea in one week or at the rate of 35 lb. per acre. Well done lower Matale! We are reminded that long ago it was prophesied by a practical, disinterested planter that the long valley (or as Highlanders would call it "Strath") or rather succession of valleys from Matale up to Ukuwella on to Watagama and why not on to Kandy, to Peradeniya, to Gampola and Nawalapitiya, would include about the richest tea growing land in the country.

As for total outturn and crops for the island, the prophecy made by the same planter some years ago of 100 million lb. for Ceylon's exports is not unlikely of realization. He would be a bold man in fact who would say that we cannot beat India in six to seven years' time, provided there is due encouragement to extend, continue and keep up cultivation.

BURMA RUBY MINES.—It has always been a matter for wonderment that the Burma Ruby Mine shares have been freely sold at a discount, when it is considered with what great *eclat* the Company was formed, the unique concession it possesses, and the powerful house under whose auspices it first saw light. The demand for the shares has been rather pronounced lately, on receipt of news from Burma decidedly encouraging to the Company, and we cannot but think that the shareholders who hang on will reap a good reward for their pains and patience.—*Colonies and India.*

THE PACKET TEA TRADE.

As Messrs. Horniman and Co. claim to be the founders of the packet tea trade, their experience as recorded by a representative of *Trade*, will doubtless be of some interest. This firm in the good old days used to make a point of advertising "the leaf uncoloured;" but their more recent transactions in India and Ceylon has altered all that.

"How long is it," asked the representative, "since your firm adopted the system of selling tea in packets?"

"Ever since the year 1826," said Mr. Horniman. "It was the founder of our firm who originated the system. His idea was that if tea were put up into air-tight tinfoil packages its fragrance would be preserved, and it would be possible to place before the consumer a tea which should be of uniform quality. How often does the average purchaser make the complaint that 'this tea is not so good as the last?' By the packet system it was sought to avoid any possibility of such disagreeable comparisons, and to make it easy for the purchaser to obtain an article which would vary neither in fragrance, strength, or price. In short, the aim was to present a tea which should be 'always good alike.'"

"That phrase seems to have passed into something like a proverb?"

"Yes," said Mr. Horniman; "and, what is more, we claim to have acted up to it. If you know anything about the tea trade you will be aware that it was in 1833 that it was thrown open. At that time importers commenced to introduce tea which was artificially coloured, the object, of course, being to pass off inferior leaves. There were two objections to this course, the first being that the colouring matter was more or less injurious to the tea drinker, and the second that a decoction made from inferior leaves was sure to be wanting in delicacy and fragrance. We refused to adopt this method, and insisted upon importing a pure uncoloured tea of good quality. Of course, our teas got a name and their reputation, despite the competition of these latter days, is more than maintained."

"Whence do you chiefly procure your supplies?"

"For many years, of course, we had to rely upon China tea alone, for it was not till 1850 that tea was produced in Assam. The very first importation from that province was consigned to us, and since that date we have always been able to secure the best spring growths from the finest of the Indian gardens. Ceylon, as you know, has recently produced some admirable teas, and we now import a considerable quantity of them. You see we devote ourselves exclusively to tea, and as we purchase upon a very large scale direct from Ceylon, India, and China, we are not only able to secure the best tea, but to avoid those extra charges which must be paid if you do your business through middlemen."

"That, no doubt, is the secret of a good many successful firms nowadays?"

"I suppose it is. It is certainly our own. We buy direct and we sell direct. We buy for cash and we sell for cash. The rule of the tea trade is to give three months' credit. We pay cash, and we take five per cent. That, upon a very large turnover, is a profit in itself. You will, perhaps, hardly imagine that we do our own printing. It may seem odd that tea merchants should be printers, but it must be obvious to you that by cutting our expenses down to the lowest point we are in a position to offer to the public tea of a quality which no one else could afford to let them have at the price.

"How did the recent reduction in the tea duty affect you?"

"We were enabled," said Mr. Horniman, "not only to give the public the benefit of the 2d per lb. which was taken off by Mr. Goschen, but to reduce our prices by still another 2d, without interfering with the quality of the tea article which we offered. This is only in accordance with the principle which the firm has pursued for the last sixty-five years in giving the public the best possible tea at the least possible price. It is upon that principle that our business has been built, and it would be obviously unwise for us to depart from it."

"Your packet teas have had many imitators?"

"Yes," was the reply, "and some of them have been anything but scrupulous. Our packets, our labels and our titles have been imitated, so much so in fact that it is well for the public to be on their guard. The old advice, that when you ask for an article you should see that you get it, certainly holds good in this case. Perhaps it is not surprising that this imitation has taken place for our labels have become almost universally known. Some twenty years ago and more a considerable enquiry for our teas arose throughout Europe and South Amercia, and to meet the demand our labels were translated into French, German, Italian, Spanish, Dutch, and Russian. Our success in foreign countries led unscrupulous competitors to copy not only our system of packing, but to imitate our trade marks and our titles. There is, however, a very easy method of finding out whether you have the real article or not, and that is by making an examination of the tea itself. Our teas consist exclusively of young and tender leaves, and they are therefore smaller than the large aftergrowth leaf which so largely constitutes inferior qualities."

"Your faith in the packet system, is, I suppose, as firm as ever."

"Yes," was the emphatic reply; "though I cannot shut my eyes to the fact that this system which we introduced has been grossly abused. There are those who find it necessary, in order to effect the sale of their tea, to offer the buyer a toasting-fork or a looking-glass after they have taken so many half-pound or pound packets. We have never found it necessary to resort to any such dodges in order to find a market. I rather think that by this time the public is beginning to open its eyes to the fact that the method I have referred to is a very dear way of purchasing tea. They now recognise that to expect good tea, when the seller has to give them a present of some considerable value in order to induce them to purchase it, is to expect a good deal too much."—*H. and C. Mail.*

Coffee in Peru.—The following paragraph among others shews the encouragement to the London Syndicate which is despatching Ceylon planters and other experts to report on land for coffee in Peru in the trans-Andean districts;—

No better coffee is produced in the world than in Peru, more especially that raised at Chanchamayo, in the department of Junin, and in the Province of Carabaya, in the department of Puno. The production amply suffices for the internal consumption, notwithstanding that the latter has much increased during the last few years.

"Quinine and Java Cinchona."—There is very little of consolation to Ceylon cinchona planters, or to London holders of quinine, in the article under the above heading on page 789. Java's supply of bark is by no means dwindling away—it is rather increasing and although she supplied the equivalent in bark for half the quinine consumption of the world in 1890, she is expected in 1891 to give enough for 4-7ths of the consumption—in other words she is to export about 7½ million lbs. of manufacturers' bark averaging 4·07 per cent sulphate of quinine! There will only be 3-7ths of the total consumption required in bark from Ceylon, India and South America. The only point open to criticism in this article that we can see, is the want of allowance for an increase in consumption. We cannot understand why with quinine at its cheapest—less than 2s per ounce—there should not spring up a demand for so valuable a tonic in new directions; while we feel sure that much larger quantities might be absorbed in Russia, Southern Europe and Africa, if only the cheap quinine were made freely available.

"CEYLON AND ITS GEMS."

(Communicated.)

The writer of the article in the *Times of India* (see page 792) is rather out as regards the Gemming Ordinance, which is even worse than he makes it out. Previous to the present ordinance being passed, there were Government regulations for mining for Gold and Gems, and orders to gem on Government land could be obtained on the payment of ten rupees per annum, but no prospecting licenses could be issued. On the other hand Government would grant a prospecting licenses for gold on Crown lands on the payment of ten rupees, and the area over which the license might extend could not exceed half a square mile while it remained in force for six months.

The grantee had the exclusive right of prospecting within that area for that period and had the option at the expiration thereof of applying for a regular lease of not more than 50 acres within the said area on the terms that the minimum breadth of any lot was to be 70 yards, and the period a term not exceeding 20 years, at the expiration of which the lease was renewable at the lessee's option on such terms as the Governor and Executive Council might fix.

These good regulations have all been repealed, and in their place an ordinance has been passed for gemming on *private lands only*, and there is nothing said in this ordinance about working for *gems* or *gold* in Crown lands; so that if any person wishes to gem or prospect for gold he will have to make a special application to the Government Agent. A more ridiculous and pernicious ordinance has seldom been passed by the Ceylon Legislature. It is a pity that our Government servants should think themselves omniscient, for to this failing may be attributed the many ill-digested ordinances which are constantly being passed and found unworkable in their original form.

As regards your remarks in Tuesday night's issue, I think your estimate of the value of the gems found in Ceylon much nearer the mark than that of the "Roving Correspondent" of the *Times of India*. He also seems to think that the "European speculators" may find gem-mining unremunerative; but if this is so, I think it will be due to the "poor native" appropriating the best stones and receiving regular wages besides. Under such favourable circumstances the paucity of "European speculators" is all the native has to complain of; but the "European speculator" may well grumble when he finds his attempts at developing an industry baulked by those who should be the first to help him. Gem digging as practised by the natives encourages them in idleness, gambling and all kinds of vice; but as practised by capitalists it means regular work and wages for the miners without the unnatural excitement which follows such pursuits; that is, of course, provided a plan to prevent stealing could be devised.

DISEASES OF PLANTS.*

After a few introductory observations on Phytopathology in its general aspect, the lecturer proceeded to discuss the questions relating to Parasitic Fungi in their connection with Plant diseases:—

The plant diseases caused by the presence of parasitic fungi are almost entirely local diseases; it is quite exceptional to find a plant constitutionally affected. True it is, that in many cases, especially with cultivated plants, the local disease is either so extensively distributed upon the host, or, more frequently, that the lesions are so numerous, that the host plant is killed by the parasite; but anything analogous to those human diseases, in which an entrance having once being effected by a microbe, the whole organism becomes permeated by disease, as in the case of febrile disorders, is practically almost unknown in plants.

Neither do we find that heredity plays nearly so important a part in the etiology of fungoid plant disease as it does in the animal kingdom. There are instances, and important ones, too, in which something akin to heredity comes into play. Certain varieties of Wheat are more liable to suffer from the attacks of mildew than others; certain varieties of Apple are more liable to canker than others; but these are more instances of the constitutional peculiarity of a variety than true heredity. A better illustration is, perhaps, afforded by the Potato, some sorts of which seem to be hereditarily disposed to take the disease more easily than others; while, on the other hand, certain sorts seem to have the power of resisting it better, inasmuch as their foliage longer withstands the attacks of the Phytophthora.

Just as we observe that certain epidemics affecting the human race, when first introduced into a community, assume great virulence, and spread with great rapidity; after a time, the type becomes less severe, and although the cases are not less numerous, yet the disease, we say, wears itself out. The outbreaks of cholera which have occurred during the present century, afford an apt illustration. The introduction of measles into Iceland, and into the Faroe, and the Fiji Archipelagoes took place in recent times. Like smallpox and syphilis, it was much more severe and fatal when thus imported into virgin soil (Fagge).

In like manner, we find that many epidemics of fungoid plant disease, which at their beginning are marked by extreme virulence, after a time change in type, and become less and less severe. The outbreak of the Potato disease in 1845 is an illustration, and although the disease is still present only too severely amongst our Potato crop, yet we have never had so severe a visitation as occurred in the above-mentioned year. More recently, the Hollyhock disease has afforded us a parallel case. The fungus, Puccinia malvacearum, which causes this disease, was unknown in Europe prior to 1869, in which year it was observed in Arragon, in Spain. In 1872 it was noticed in the Department of Marne, in France; in the following year (1873), it had extented over France into England, devastating not only the Hollyhocks, but attacking also the indigenous Malvaceæ. For several years, so virulent was it, that the Hollyhock practically disappeared from our gardens. The fungus is still present with us, and can be found upon almost any of the common Mallows; but it has lost, to a great extent, the extreme virulence which characterised its first outbreak. Our indegenous Mallows remain with us, and the Hollyhock is beginning to re-appear in our gardens. A very similar case is that of the Celery disease. Some years ago Puccinia Apii appeared on cultivated Celery, and threatened to become as serious an affection as the Hollyhock disease subsequently proved. It spread very widely in Great Britain, and greatly alarmed horticulturists; but it soon spent itself, and although the Puccinia is common enough on our wild Celery plants now, yet we rarely meet with it in our gardens.—*Gardeners' Chronicle.*

* A course of lectures delivered before the Royal College of Surgeons by Professor Plowright, M. D., in February, 1891.

IMPROVED TEA MACHINERY:

JACKSON'S PATENTS:—NEW DRYING AND WITHERING MACHINES.

INFRINGEMENTS OF PATENTS: MORE WORK FOR THE LAWYERS.

Mr. Jackson of Aberdeen, the now famous Tea Machinist and Engineer, was, as we announced, a passenger by the S. S. "Massilia" and the Colombo lawyers will, at least, welcome his advent. For, it would be scarcely necessary for Mr. Jackson to have left the superintendence of his Exiperimental Workshops at home, save for "legal" business which specially cal'ed for his personal presence in Colombo.

The infringements of his patents which Mr. Jackson considers he can prove before law courts this time —no notice having been taken of business remonstrances—concern two rollers, the one prepared and patented by Mr. John Brown of the Uva Companies, &c., and of which about a hundred are supposed to be at work in Ceylon Tea Districts, and the other, the Tea Roller known as "Law & Davidson's."

But having to come out to consult and direct the lawyers. Mr. Jackson has some interesting new machines which he intends while here to bring before the Ceylon planters. We refer, first to his new "Britannia" Tea Dryer which offers great improvements on the "Victoria" dryer, more especially in the tea being fed below and the machine doing all the rest of the work for itself. There is a down-draft connected with it. Three sizes of machines to dry 1, 2 and 3 maunds of tea per day are made, costing about £100, £200 and £300 sterling each. The first of these Driers—one of the largest size—is about to be erected on Labukella Estate, Ramboda Pass, while others are on the way out. The "Britannia" looks a thoroughly substantial, workmanlike machine strongly made as indeed are all Mr. Jackson's machines, and the patentee is confident of it giving satisfaction.

Perhaps a machine of more general interest is the new patent Witherer which Mr. Jackson is bringing out. This, he is also confident, will prove a practical success. It is not generally known that Mr. Jackson keeps up an Establishment in Aberdeen solely for the purpose of endeavouring to devise and apply improvements to Tea preparing Machinery. Besides Mr. Dalgarno, there is a staff of eight Assistants and Mr. Jackson (like Mr. Edison of inventive fame) has to be the presiding genius. An interesting fact mentioned to us by Mr. Jackson as showing the rapid advance of Ceylon in comparison with India, is that the colony required about as many rollers as India last year, while for 1891, the demand is likely to be a good deal larger for our little island, than for the big continent opposite.

THE JAMAICA EXHIBITION: THE THE POTTER AT WORK.

In obtaining the services of a first-class English Potter the Commissioners of the Exhibition were performing a great service to Jamaica, and contributing to the real objects of the undertaking. The island possesses clay in vast quantities, the capabilities of which have never been thoroughly tested, and it was a happy thought to import a skilled potter, both to test the clay and to show how best it could be practically utilised. The potter is now stationed in the Exhibition, and to witness him at his work alone is worth double the amount of entrance money to the ground.

[The above, from the *Jamaica Gleaner*, shows what might be done if we had a Ceylon Exhibition. We have abundance of fine porcelain and terra-cotta clays in our island, which could be probably utilized if a skilled English artizan were imported to show the way.—Ed. *T. A.*]

"The Cinchona Market"—writes an upcountry planter—"is deplorable. It is the longest lane without a turning that I have ever had to do with—and I 'm beginning to regard bark with well merited contempt. I don't know if that will bring it to any kind of sense of the rightness of things, and what is due to growers?"

Ceylon Tea Selling at £10 12s. 6d. per lb.—Where is this sort of thing to end? If only a certain number of Ceylon estate proprietors instruct their managers to compete with "golden tips" for the sake of the advertisement, Reuter will yet have a good many messages to send us about select parcels of Ceylon tea getting unprecedented prices in Mincing Lane. Meantime all this helps to bring Ceylon tea into everybody's mouth!—and we should be the last to complain. On the contrary we have to congratulate Mr. T. C. Anderson of Garmore estate, Maskeliya, on topping the market and "taking the cake" even from Gallebodde. How long will Mr. Anderson be allowed to remain champion?

Sea-weed and Coconuts.—The seashore between Colombo and Mt. Lavinia—and indeed much farther down the coast—is, at this season, strewn with large quantities of sea-weed washed ashore. This has been the case for many weeks back, and yet only in very few cases so far as we know, has any attempt been made to collect this useful manure and apply it to the neighbouring coconut palms. The apathy of the villagers in this respect is very striking. There can be no doubt that a very little exertion in digging round the roots of their trees, and applying rubbish, sea-weed, &c., (that would be much better in every way if buried), would increase their crops of nuts very materially; yet, with the fewest possible exceptions this is never thought of, and absolutely nothing in the shape of cultivation is attempted.

Tea Upcountry.—It is quite cheering to note the universal good report of tea from one end of the hill-districts to the other, and of its flourishing so famously even on old coffee estates. For instance, in Hantane, take the upland valley above Kandy, with Oodowelle—opened over 50 years ago,—Oorogalla, Horogalla and Ingrogalla, all giving good tea and promising well. Oorogalla with 280 acres of tea is quite a model of what a well-cultivated old coffee plantation may be expected to do in tea. But the same is true of many of the old Elkaduwa and Matale places, while rivals to Mariawatte are to be seen around Ukuwala; and on the road North of Matale, some of the finest tea in the island is to be seen. Whose is the small field of tea on the roadside near Nalanda, many miles out? It is neglected and all weedy, but the tea is resolved that no other jungle shall have lodgment and is forming a jungle of its own; for as an old Kandyan Arachchi said in the early days of tea "It is a jungle plant and not like coffee at all."

Linnean Society.—At the meeting held on February 5, Prof. Stewart, President, in the Chair. Messrs. Richard Bentley and E. S. Goodrich were admitted; and Messrs. T. F. Bourdillon, C. T. Keane, and A. M. Marshall were elected Fellows of the Society. Mr. Clement Reid exhibited and described some recent additions to the fossil arctic flora of Britain. Mr. Thomas Christy exhibited and made remarks on some specimens of honey: (1), "Arbutus honey" from Turkey, said to produce great drowsiness and sleep; (2), "Eucalyptus honey" from Mount Barker, Adelaide, said to possess valuable therapeutic properties; and (3), so-called "wool honey" from the Euphrates, collected by natives from the leaves of the Oak, and which would be more properly termed "honey-dew," being formed by aphides, and not by bees. On behalf of Mr. Gammie of Sikim, Mr. C. B. Clarke gave an abstract of an interesting paper on "The Tree Ferns of Sikim," in which several moot points were discussed, and difficulties cleared up. At an evening meeting to be held on February 19, 1891, at 8 p.m., the following papers of horticultural interest will be read:—"The Dillenian Herbarium," by G. C. Druce, F.L.S.; and "Some points in the life-history and Rate of Growth in Yew Trees," by Dr. John Lowe, F.L.S.—*Gardeners' Chronicle.*

Correspondence.

To the Editor.

PLANTING IN THE NATIVE ESTATES, OF THE STRAITS SETTLEMENTS.

To the Editor "Ceylon Observer."

DEAR SIR,—In forwarding you the crop returns of our estates perhaps a few words on the subject may not prove unwelcome.

In 1878, when I was leaving Ceylon, I promised to send to a personal friend a treatise on the rotation of manures, a subject which had occupied much of my attention in connection with the estates of which I was manager in Ceylon.

I finally came to the conclusion in Ceylon that we had started too late, at any rate on most estates, and for estates to become more permanently productive it would be necessary to do more to cultivate the land, and that trees should be younger at the time of commencement to give the cultivator satisfactory returns. The hard life of a pioneer is not calculated to foster writing in any form and therefore my promise was never fulfilled, and as time has gone on and I have gradually been developing what might have been called theories into practice, I have felt less and less inclination to write until I could, as I can now, refer to actual results. I think that the measure of success so far attained will gradually be developed to an even greater extent.

ESTATE NURSERIES.—I will commence with the nurseries of an Estate. These have always been made from seed from carefully selected trees in the youngest planted clearings in some instances, and in others from the older coffee. But recently marking the great improvement in the form of all the last planted clearings in having their primaries quite close to the ground, I have decided only to plant the cherry from the selected trees of the youngest clearings. The seed having been gathered, is pulped by hand, and any small parchment and malformed beans rejected. The seeds are then laid on raised platforms with earth, ashes, etc., to germinate, and as they germinate they are carefully put into the beds in the nurseries, where they are kept constantly top dressed with burnt earth, ashes and *lime*, if available. In one of the last nurseries out of 16,752 germinated seed 16,750 were put out into the field. I am inclining more to again bring selection into play, by planting my nurseries 8 in. apart and only putting out the selected plants, which it is my intention in future only to put out after they are shewing primaries. The clearings, having been planted with selected plants, from selected seed, from selected trees, are only treated in the ordinary way, except that should a plant show signs of weakness in any respects, it is either at once taken out and destroyed or another plant is put alongside it, and when the time comes the selection made as to which is to have its life granted. The youngest clearings are being topped at 5 ft. 6 in. having ample primaries they are planted 9 ft. by 10 ft. but I am inclined to think I shall probably feel my way back to 12 ft. by 12 ft. and putting out much larger plants than I have hitherto done. Stumps come on splendidly, but I have the greatest objection to that little piece of dead wood that you can generally find in a plant, however vigorous, if it is cut across just above the place of junction between the bud and the top of the stump. Even when they are old trees you can find this. From this until the 4th or 5th year the plants receive ordinary care and attention, except that they are pruned every 6 weeks, or at longest two months. From the fifth year at latest commences the cultivation of the land. You will remark I do not say manuring the tree, although at first it really amounts to that.

For the first year I have used oil cakes of various kinds, ashes and bones mixed with as much earth as possible. In my opinion the quantity of earth with which a fertilizer should be mixed cannot be too great although it is an advantage to put ashes (the potash being so heavy and sinking so rapidly) on the mixed earth. For the second year I use much the same mixture, with the addition of burnt earth, but differently applied.

For the third year, according to the nature of the soil, I either mulch with lalang (*Arundinacea Imperata*) Ellook it is called in Ceylon; or else lime the land with quick-lime, about 40 pikuls to the acre, a pikul being 133 lbs. It would depend upon the nature of the soil, and transport facilities which I should have done first.

This is as far as I have got at present, but the fifth course of the rotation would include digging over the land and turning the weeds in.

I should mention that weeds are allowed to grow sometimes for 3 months on end, after the 4th year, and they have been allowed to grow for as long as 6 months, and then cleaned up and kept clean by weeding, once in 3 weeks, for 6 months on end. I am entirely opposed to an estate being always clean after its fourth year, although I would keep the clearings clean, there being sufficient humus on the soil to absorb the rain and fix the phosphoric acid contained in the rain water.

I will now proceed to give you a few remarks on Climate, which we can only change for the worse wilfully; Land, which it is in our hands to improve; and Labour, which with the aid of the Government could be put upon a satisfactory basis.

CLIMATE.—In 1879 I referred to the climate as being near perfection for the growth of Liberian Coffee, and I think that the results may be said to bear out that view, that is to say, the present climate; but if or when the climate is changed by the denudation of forest over large areas we shall probably see that our coffee will fail in the same way that it has in many other places. With this experience to look back on, I submit it would be well worth while the Government considering how this is to be prevented, more especially as they derive an income from export duty and rent on the land. At this stage of the development of the country it would be an easy matter to prevent that loss of moisture in the atmosphere and to prevent any radical changes in the climate. The amount of moisture contained in the atmosphere, the heavy dews and morning mists lying over the trees, often until 8 o'clock in the morning, are some of the most important factors in the successful growing of large crops of coffee per acre. Whilst they exist, with care and cultivation we may look for equally good if not better crops than those the statement I forward you shew. When these mists and dews have disappeared by reason of the forest being extensively felled, we may look for our crops to fall off, as they have elsewhere. This certainly will be remembered by some of the old planters of Ceylon.

How then is it to be prevented? By the Government reserving the right in the public interest to control the felling of the trees. Thus A wishes to plant an Estate of 300 acres, the Government sell him 1,000 or they sell him 300 as he wishes, and retain the 700. When his 300 acres have been planted and perhaps part of it worn out, he applies for part of the 700 acres which should be granted to him acre per acre for his land, that is for the time worked out. That is planted with an agreed number of forest in fruit trees per acre that are visible and subject to verification. But 23 years' observation of tropical cultivation leads me to believe that perennial cultivation, to be successful, is a system of long crops and long fallows, which the system I advocate admits on although I fear the desire of those in charge of new countries to increase the revenue at the cost of the capital of the country, which is as much in its climate, as its soil, and its minerals, may not procure for these views the consideration that the results of cultivation in similar tropical climates would lead one to expect and hope for.

I am well aware that for one or two years the dryer atmosphere will produce even more blossom and sometimes even crop, but the trees will not stand up to ir crop or recuperate so quickly.

LABOUR.—This all-important item to the planter might easily and quickly be put upon a satisfactory basis for those who did not object to paying their coolies well. At present labour is not altogether satisfactory but the reason is not far to seek, as you will see from the attached table of amount spent on Public Works and Municipalities during the past 10 years. But when I tell you that neither the Municipalities or the Governments have any fixed staff of labour and that their attempts to import immigrants would not exceed 500 men during those ten years you will see how serious the position is. By the right of the longer purse they can always attract any labour from the estates, so that some planters against their will are compelled to work with indentured immigrants. With two exceptions that I know of, amounting to about 1,800 men, I am under the impression that the labour imported by Government contractors would not exceed 100 men in any one year. I may tell you that very little work is done departmentally, and what is done departmentally the labour is derived from the same sources in the same manner, the so-called open market—that being any coolies that can be obtained locally. Under these circumstances, which I trust the report of the Labour Commission may in some way alleviate, you can recognise that we are driven to employ indenturer immigrants against our will, costing on the estate, with which I am connected about $27 each; of this I may recover possibly $9, but with runaways, incompetents, sickness and deaths it probably does not exceed an average of $6. Some of the officials say, 'What harm do we do? You get a man on agreement and when it is expired we take him at higher wages," but in my opinion the answer is "As long as you equally supply in proportion to your requirements the *local* market, we have no cause of complaint, but until you do so, you are strangling planting enterprise in its infancy by competing for the labour they have imported."

There are certainly few if any Ceylon Planters who will not say that a free coolie is cheaper at 25 cents per day than an immigrant at 14.

Paradoxical as it may sound, in my opinion an emigrant is cheaper on a one year's agreement and 20 cents per day, than on a 3 years' agreement and 14 cents, owing to the bulk of the men being of a better class. But the recruiting in India is miserably bad, and owing to the treatment received at the hands of the professional recruiters the men will not go to bring their families and friends as in Ceylon. If you get 35 good and fairly good, 15 of indifferent, bad and absolutely useless in a gang of 50, you may consider are you well off.

It would not matter to us whatever rates the Government paid if they imported a proportion of their own labour, as it would render the countries popular and induce a flow of immigration to them.

So much for the Tamil question, upon which I speak with some feeling, from having been compelled by want of labour to abandon 360 acres of Coffee in Sungei Ujong in 1884 although it had over 5 cwts. an acre on it. Pickers were not to be had and as the crop had all dropped the year before it was useless to spend further money on upkeep.

At the moment I am well supplied on all the estates and I hope to remain so from the growing popularity and a few old connections that have come from India, as free men, but there is the contingency to be faced that the Public Works in connection with the development of the States may at any time be let at such rates that all the labour from the estates may be drawn away.

We have then left Malays, Chinese and Javanese.

Malays are excellent labour for many kinds of work, and particularly nice people to work with. If I knew an estate had been planted by Malays I should feel inclined to put a slightly higher value on it. They are such very careful planters and they plant a tree as if they remembered that it was expected to give returns for 30 years or more. For felling, shed-building, timber-cutting, roofs and many other works, although their wages are rather high—from 26¼ to 35 cents—they are not only very valuable but their work does not become expensive

Chinese as sawyers, carpenters and artisans, when they mostly speak Malay, are largely used and good men at their trades. The coolies are good for heavy work, but the great objection to employing them is all arrangements must be made through the head man who can talk Malay and he almost invariably robs them and tells them it is the employer. They cannot therefore be looked upon as satisfactory to the coffee planter.

Javanese are in much the same category. Few of them speak Malay and they are mostly worked through a mandore. I have had a gang of 50 men working for me for 4 years on end, and on and off for another 3, and never had a dissatisfied word from them, but then the mandore was an excellent fellow, and he still continues to work for me at times although now a man of means.

Watchmen are mostly Sikhs or Bengalis and I have no doubt in time they will bring friends to work on the estates.

SOIL.—Attached will be found the analysis of 4 different parcels of soil. They were all taken from 6 inches below the surface. No. 3 is of course an ideal soil but very wet. No. 1 is the poorest land of the Malay Peninsula, but I have seen fairly good young coffee on it, and it is used by the Chinese or Pepper and Gambier.

No. 2 is the soil taken from Batu estate and from the paper you will see what the crops have been and are, with its surface soil intact. Only over-bearing trees require manure for many years to come.

No 4 is from Linsum estate and there again you have practical results to judge from. They are noted on the 1·24 by the analyst as being poor in potash and phosphoric acid. The one has been supplied in ashes and burnt earth and the other in the bones.

There are all sorts of soil, and all kinds of land, steep, undulating, flat, rocky and free from stone, stony and extensive alluvial deposits of rich soil.

I cannot conclude this letter without expressing my hearty thanks to all the officials for all the assistance and kindness that they have shown to me both in the Straits Settlements and the Native States and to express the hope that with their continued assistance - may become that rare bird, a successful pioneer, owinI entirely to the good will and assistance received ig difficult times from the many officials who have taken so much interest in developing planting in the Straitsn

Yours faithfully,
THOS. H. HILL.

SOILS.

Analysis of three samples of soil marked 1 2 and 4, dried at 212° Fah.

	No. 1.	No. 2.	No 4.
Silicious matter	81·166	72·000	68·567
Alumina	8·400	14·966	16 800
Oxide of Iron	4·656	3·779	6 150
Lime	206	336	261
Magnesia	166	300	433
Potash	006	135	193
Soda	153	151	141
Phosphoric Acid	044	121	083
Sulphuric Acid	051	054	069
* Organic matter Water of Combination &c.	5·093	8·158	7·303
	100·000	100·000	100·000
* Containing Nitrogen	·033	·126	·140

All of those soils are poor in potash, No. 1 being particularly so. They are also exceedingly poor in Phosphoric acid, especially No. 1. They would all be better for liming.

So-called soil, No. 3.

Water (*i. e.* moisture) ...	33·00
*Organic matter, &c. ...	24·56
Phosphoric Acid (Phospate of Lime 13·49)	6·18
Lime ...	5·72
Sulphuric Acid ...	6·17
Oxide of Iron ...	4·05
Alumina ...	2·69

Oxide of Copper	...	·12
Magnesia	...	·45
Potash	...	·78
Soda	...	·69
†Nitric Acid	...	3·50
Silica	...	12·90
		100 00

*Containing Nitrogen	95	·18
† Do do	89	
Total nitrogen	1·84	Ammonia 2·23

CROPS.

Statement of Produce of Liberian Coffee Estates in the Native States. [This was given in *Observer* of March 13.—ED. *T. A.*]

Memorandum of number of BOXES OF CHERRY gathered on the Estates, showing when the crop seasons are.

LINSUM ESTATE.

	1884.	1885.	1886.	1887.	1888.	1889.	1890.
January	—	—	452	397	501	692	1,328
February	156	97	653	477	910	390	399
March	—	305	—	153	493	721	789
April	—	69	143	27	136	299	192
May	128	198	8	—	224	—	—
June	159	—	115	385	439	854	756
July	98	—	577	528	505	1,188	663
Angnst	137	216	225	381	408	316	187
September	—	577	—	—	—	38	32
October	—	415	—	138	—	—	30
November	—	140	83	6	143	60	58
December	—	485	329	293	557	367	392
Total	..678	2,502	2,495	2,785	4,336	4,925	4,756

S'LIAN ESTATE.

		1885.	1886.	1887.	1888.	1889.	1890.
January	..	—	680	230	534	412	483
Febrnary	..	—	182	425	446	739	887
March	...	13	46	44	303	175	86
April	...	23	—	—	158	103	43
May	...	174	25	10	252	215	—
Jnne	..	—	328	175	576	323	510
Jnly	...	—	394	244	264	434	513
Angust	...	—	202	92	267	318	40
September	...	—	—	64	149	27	27
October	..	259	—	41	—	—	—
November	..	10	54	95	55	110	51
December	...	146	364	236	338	316	529
Total	...	625	2,275	1,656	3,342	3,172	3,169

WELDS HILL ESTATE.

			1886.	1887.	1888.	1889.	1890.
January	...	...	248	482	553	643	435
February	...	...	210	498	704	527	507
March	...	...	76	—	72	—	260
April	...	...	21	163	234	—	—
May	...	...	26	61	—	—	—
June	...	...	603	284	624	1,214	290
Jnly	...	...	58	—	487	870	435
August	...	...	131	260	—	—	—
September	...	...	—	—	—	—	—
Octoucr	...	...	—	31	6	—	21
November	...	...	205	112	507	2	56
December	...	...	512	820	195	1,165	369
Total			2,192	2,712	3,882	4,421	2,374

BATU CAVES ESTATE.

		1888	1889	1890
Jauuary	...	—	—	149
February	...	—	90	265
March	...	—	164	95
April	...	50	—	—
May	...	—	—	—
June	...	84	110	125
July	...	—	—	102
August	...	30	107	—
Sep1ember	...	80	—	—
Oct· ber	...	—	—	—
November	...	—	—	—
December	...	260	18	—
Total	...	591	489	—

CEYLON TEA IN RUSSIA.

St. Petersburg, 4/16th March.

DEAR SIR,—By today's post I have sent you two circulars of the "United Kjachta Tea Co.," which have opened a large business in St. Petersburg. The pictures on the back represent the primitive methods of transporting the tea from China, through Mongolia, Kjachta and Siberia before it reaches Russia. The central picture represents the shop belonging to the Co. on the Nevsky Prospect.* It was my intention, had I remained in the trade, to have started a similar establishment in Petersburg or Moscow and sell Ceylon tea in its pure state or mixed with Chinese in order to suit the taste of the public. This would have been the first step before launching out in a stil larger business.

The Director of this tea business informs me that he would like to receive samples of the finest Ceylon teas direct from Ceylon, as he finds the Ceylon tea very suitable for mixing with the Chinese which is wanting in flavour. In case any of your planters wish to start a business in Petersburg he would be quite willing to sell the Ceylon tea in its pure or mixed state. I think this would be a grand chance for the tea planters of Ceylon, and as they are not strong enough in this country to break down the opposition of the wealthy tea merchants, they could not do better than work together with them.—I remain, yours very truly,

WM. BARNES STEVENI.

P. S.—A tea merchant from Irkutsk has also asked for samples of Ceylon tea.

SALT IN AGRICULTURE.

March 28.

DEAR SIR,—I feel very gratified at the support my appeal has received from the Press. I shall in this communication offer a few remarks on the editorial comments on my letters, chiefly to keep the snbject before the eyes of the public and the Government, so that the latter might be induced to take action in the matter.

It has been urged that no new arguments in favour of the manurial valuo of salt, or of the difficulty of rendering it unfit for food are to be fonnd in my letters. I expressly disclaimed any pretensions to originality. What can I, a layman, say that is new of a substance whose manrial value has been acknowledged almost from the beginuing of time, and of whose virtnes the votaries of Agricultural Science have since sung? What wo are immodiately concerned about is, nor so much its value as a manure, as its indespensability in coconut cultivation laud what is well known is reiterated, that Science has proved the possibility of purifying salt that has been mixed with offensive substances. The practical man is concerned with enquiring whether the average Native, Sinhalese and Tamil, is so conversant with the teachings of Science as to experiment with contaminated salt, and whether there is the slightest probability of his nsing such salt as food, even were he able to purify it. Those who profess to answer these questions in the affirmative will proclaim their ignorance of the habits and deep-rooted prejudices of

* These circulars can be seen at our office.—ED. *T. A.*

the natives. Mr. John Hughes, the consulting Chemist of the Ceylon Planters' Association, will, I am sure, be acknowledged to be a practical man, both by his training and by his wide experience of human nature. He writes in reference to the refusal of Sir James Longden's Government to issue salt to a planter in the Agras, who had applied for 50 tons at the export rate of R5 a ton, to fight against grub, and who offered to pay the salary of a Government officer to supervise the application: "I wish merely to point out that there are means available for so mixing salt with certain manurial materials, that the subsequent extraction of salt in a condition at all likely to be used for food should be rendered extremely improbable. First of all, I would say why not convert the crude salt into a manure by adding 2 or 3 cwt of finely ground fish manure or dried blood, or even Peruvian Guano to every ton of crude salt? Any one of these materials would so strongly impregnate the mixture, that the natives with their natural caste prejudice against handling any foul matter, much less of having the same brought in contact with their food would certainly refuse to purchase salt possessing any such peculiar odour as the above material would certainly produce. There is no doubt salt is a most useful and cheap source of manure, and it seems a distinct loss that any Government shoul throw difficulties in the way of its local use as a manure. My own view is that salt applied as an ingredient of a mixed manure is likely to be more effective in an agricultural sense then when applied in large quantity in the hope of destroying grubs." It will be noted that the above remarks apply chiefly to salt as manure for coffee. If I were convinced that the tax on salt were oppressive, and to any appreciable extent restricted its free use for human consumption, I should certainly when advocating its issue at cheap rates, have urged its abolition as an alternative. Though theoretically the tax may be objectionable it is not invidious and oppressive, as the tax on paddy unquestionably is, and I believe nine-tenths of the population do not regard what they get an equivalent for, as they do in the case of salt, as a tax at all, much less as an oppresive tax. Under the circumstances, I think the general denunciation of taxes and the setting up of the masses against the classes, with the issue of Salt for agricultural purposes as a (pre)-text, was both uncalled for and mischievous. A futile attempt was recently made, not by, but on behalf of, the rich "to save themselves and fasten burdens on the poor," when with the aid of specious arguments and sophistry laboured attempts were made to prove that those who issue rice to their labourers at a profit pay the impor-duty on it, while those who deny themselves this profit and give their labourers cash do not pay it. Therefore, the latter ought to pay an export duty on their produce, and not the former.

Though an official was at pains to state that it was not within his knowledge that salt was used in paddy cultivation, yet it is well known to those who take the trouble to observe what they see that those tracts of fields that are periodically submerged with sea water grow as fine paddy as one could well wish for. I have not, as suggested, lost sight of one of the chief attributes of salt, its hygrosuptive property. I drew attention to that, and spoke of it as giving salt a value "all its own." I look upon its ability to absorb the moisture of the atmosphere as investing it with a very high value in those inland districts where the tree suffer much from the effects of drought. I applied salt to some coconut plants I put out last season. Dry werther followed almost immediately after. The ever-widening circle of moist earth round the plants of a morning was very noticeable. The information that, though coconuts refuse to grow, or rather do not flourish, near Rangoon, 25 miles distant from the sea, and yet do remarkably well over 700 miles up the river Irrawady, and the reasons for it, are highly interesting, and shew how unsafe it is to generalise from insufficient data. The natural conclusion a mind not given to dive deep for the why's and wherefore's of the apparent contradictions it meets with, would arrive at from the above facts would be that salt is not essential for the healthy growth of coconut palms. The true conclusion is the opposite. The nuts at Bibile, like those at Mandalay, may be extraordinarily large because they belong to the large variety of coconuts. There are said to be eight varieties of coconuts and many sub-varieties. Large sized nuts are known as Siam coconuts. Trees of this variety can be seen at Morris Place, Slave Island. Many people have a fancy for these nuts, and it is possible that a few of these large-sized nuts were taken to Bibile and grown there, and the trees now growing may have been propagated from these. This is a mere surmise based on my observation that soil has no marked influence on the size of nuts, which is almost entirely depended on variety. Large-sized nuts are no advantage, however, for we get fewer of these than normal sized ones from a tree. I passed through Bibile on my way to Batticaloa about a dozen years ago, and do not remember having noticed any coconut trees there. A very flattering opinion of my attainments suggests my being able to throw light on the reason for the size of the nuts at Bibile. As I said before, I lay no pretentions to being anything but a practical and observant Planter, with a rudimentary knowledge of Agricultural Science. If there be an Agricultural Instructor anywhere in the neighbourhood of Badulla, I would suggest that the Superintendent of the School of Agriculture direct him to make a careful report of the trees in question, with the nature of the soil on which they grow, and send to him a sample of soil within 18 inches of the surface, another from a depth of 2 to 3 ft., and a sample of the water as well. Exceptions go to prove the rule, and as fine trees on hard cabook soil as on sand may be met with on the sea coast, but I think I will hardly instance those at Beruwalla (Magalkanda?) as an exemplification of this, though they certainly are better than trees met with inland on similar soil. The reason for this may be that the salt carried so freely to these soils renders soluble the large percentage of potash they contain as well as phosphoric acid and nitrogen in smaller quantities. Potash forms about 50 per cent of the mineral matter of the coconut tree. It is interesting to know that what observation led me to adopt is practised on the West coast of India. Being impressed with the value of water in coconut cultivation, I sought means to store as much rain water as I could on the estate I supervise. With this end in view I cut trenches as nearly level as possible at right angles to the slope of the land. These not only catch rain water, but improve the texture of the soil. This plan finds no favour with those whose book-learning teaches them that in good husbandry drains must be cut to draw away moisture. This has special reference to the cultivation of roots and cereals with delicate roots and on low-lying land. We should not blindly follow scientific theories, but must adapt scientific teaching to varying circumstances. What is absolutely necessary in water-logged soil and in the cultivation of plants with delicate roots, need not be adopted to the letter in the cultivation of coconuts, and on soils when the lay of the land and its composition favour free natural drainage.—Truly yours, B.

MR. HOLLOWAY'S CACAO FIGURES.

DEAR SIR,—It is very far from my object to say anything in the remotest degree detrimental to the cacao enterprise. On the contrary, it is my firm belief that exaggeration and high inflation such as I complain of in the exuberant outpourings from Wattegama are themselves the surest source of ultimate harm.

Mr. Holloway's letter of 30th ultimo does not fairly answer my objections. I objected to the suggestion that 6-year old trees would bear 100 cwt. per acre and yield a value of R6,500 value per annum per acre on his figures—of a yield of 300 pods. He now goes further and says "as regards full-grown trees giving from 300 to 400 pods any cacao planter can tell me of *many such* trees even of Caracas."

Where are we being led to?

One acre of 6-year old cacao is to yield us R6,500

per annum and when full-grown *many* trees will yield 33 per cent more!! He himself has to tax his memory and in support of his assertion recalls his visit to Galagedara in "the seventies." Let him go back to Galagedara in the "nineties" and tell us all about it.

It is not fair to single out rare instances and parade them as an index of ordinary results.

Let us be just sanguine enough to inspire our earnest work but never moved to inflation of our enterprize or *ourselves*. The production of gigantic pods, or leaves, or gooseberries (may I add, estimates and statements), and calculations based upon them, never had any useful effect in the promotion of agriculture.

The grain of wheat in all that chaff from Wattegama is contained in the remark that we have always something to learn.

I learnt long ago to avoid reading paragraphs about *enormous gooseberries*. I have still to learn.

PLANTER.

CACAO CULTIVATION: MR. HOLLOWAY IN REPLY.

Ukuwala, March 30th.

DEAR SIR,—With referrence to the letter signed "Planter" (given above) I can only say that if this planter and the others who consider my figuresmisleading will visit Franklands estate, almost adjoining Wattegama railway station, my son, who is in charge of that estate since October last, will be pleased to show them our Forastero cacao trees, the stems measuring from 20 to 27 inches in circumference, one foot above ground, from 18 to 25 ft. in height with a spread of from 15 to 22 ft. These trees are about six years old. As regards the outturn given in my letter, the pods were selected, weighed, put to ferment and washed under the supervision of my son who had made some arrangement with another planter to cure 100 of Forastero pods while he was to do the same with Caracas from his estate and then compare results. You will remember a pod weighing 2 lb. is not our largest, for the pod sent to you some time since weighed 3¼, and Matale 25 Exhibition pods between 2 and 3 lb. each. Anyone can beat the outturn even of one pod and then satisfy himself that I was rather under than over with my outturn of selected pods.

As regards full-grown trees giving from 300 to 400 pods per tree, any cacao planter can tell him that there are many such trees, even of the Caracas. I know on several estates such crop has been obtained on some trees. When I visited Greenwood estate, Galagedara, in the "seventies" I distinctly remember counting on several trees that number of pods; branches were supported by sticks. I then told Mr. van der Poorten if he allowed such crop on his young trees he must give them nourishment at once, else the trees would soon stop giving crop.

I am now planting up about 300 acres on this estate with Forastero cacao for Messrs. Owen, Bayford & Deverell. There is a great difference in quality and depth of soil, lay and aspect of land, in old shade as well as jungle shade. Yet by careful management, though costing a little more than common work, I trust to bring up the plants to be healthy and hardy all throughout and in time to give first-rate crops. An unchecked growth in plants makes the best bearing trees, though at times a stunted tree throws up a good sucker which also bears well.—Yours faithfully,

J. HOLLOWAY.

If those two planters who came the short cut through Goenambil and Franklands on 17th March 1889 and got in the train at Wattegama when I was also a passenger (a stranger to them and they to me) will now come down that short cut again they will see that Holloway, though he was successful on Maria and Raxawa, failed at Wattegama as they were pleased to say one to the other. They will see "Holloway" let the weeds and turf then grow with an object now obtained, they will find estate clean and trees full of vigour.

Though I am now a planter of 33 years' standing, yet I am not proud to say I am still learning daily. You sometimes hear youngsters who have been out about a year or so one say to another: "Oh, I know all about planting now." We shall never finish learning about the treatment of plants soil and. J.—H.—[Hear, hear.—ED. *T.A.*]

MR. HOLLOWAY AND CACAO CULTIVATION

Greenwood, April 13th.

DEAR SIR,—It is only today that Mr. Holloway's letter is brought to my notice, owing to absence from home.

I am at a loss to understand why he mentions my name in it except if he identifies me with his antagonist "Planter" who I am not.

I find that Mr. Holloway honored me with his visit on the 29th September 1882 (not in the seventies). I do not remember that he gave me his valuable advice about giving nourishment to trees which had borne a heavy crop. I may assure him, however, that acting on the secret he thinks he imparted to me or on commonsense, I have tried the process in all its ways, but have found that it would not prevail against the root disease which began here in 1884, and attacks nurseries and young trees before the mature ones. Cinchona, jak trees, coconuts, &c., have also suffered in a great many places since then, but little notice has been taken of this as the change is gradual and I am also inclined to think that it is the cause of the other diseases which affect the coffee. But being no authority on this matter it might be well to put this down to *malnutrition.*

I am quite of the opinion of the "youngsters" that if they have an average intelligence they ought to know all about planting two or three products in the tropics in one year. Those great secrets people fancy having torn from nature are often old and well-known or prove valueless. Nature yet remains inscrutable in the main point which I saw admitted by a scientific authority on Agriculture a few months ago.—I am yours truly,

A. V. D. POORTEN.

A TRIP THROUGH THE KELANI VALLEY.

DEAR SIR,—It is now 12 months since I was up in the Kelani Valley, in my opinion the leading and most flourishing tea district in Ceylon, and it was with pleasure and expectancy that I left Colombo by the 2·30 p.m. coach on Sunday last, the 5th inst., for Awisawella. On starting the coach was only occupied by Europeans and the drive up was a pleasant one, the road being in excellent condition the whole way, and the horses, for a wonder, good. At Hanwella we picked up the popular Police Magistrate of Awisawella, Mr. Philip de Saram, whom I was glad to see looking hale and hearty, and the rest of the journey was passed in reminiscences of home experiences and adventures. I stayed the night at the Awisawella resthouse, and next morning proceeded by hackery to Ruwanwella. The change along this road is vast, as large new clearings are being opened up on the one side, while the other face is one conti-

nuous sheet of splendid tea, Dewalakande estate with its fine factory standing prominently to the front. At Ruwanwella resthouse, where I spent the night, I met Mr. A. E. Scovell of Strathellie, and together we travelled through the Ruwanwella group of estates, which in time should prove the most valuable in the district, as the soil is exceptionally good here, and the clearings are mostly planted up with indigenous and first-class hybrid jats. The new road to Veyangoda, which when finished will be as fine a cart-road as any up-country district can boast of, is making good headway now, passes through most of the best estates at this end, and the fields of tea are a sight worth seeing. Travelling along this road one remembers Mr. Inglis's song of "Tons and Tons, and Tons of Tea," and certainly the words are true. After leaving the Ruwanwella end we drove along to Lavant estate, Yatiyantota, there to be gladly welcomed and hospitably received by its ever popular proprietor Mr. F. J. Wright, whom I was glad to see looking the picture of health and spirits, his appearance speaking volumes for the climate of this end of the Kelani Valley. After spending the evening with him and going round his valuable property the next morning our party broke up, Mr. Scovell proceeding up the Gap to Strathellie, whilo I retraced my steps to Veyangoda, reaching the station to catch the evening down train to Colombo, which, owing to the Sinhalese holiday, was crowded to overflowing and consequently half an hour late. My trip was a most enjoyable one, meeting old friends and finding everything prosperous and flourishing, and I hope that the Kelani Valley and its "good men and true" will continue to keep to the front, "until the day after tomorrow." M. B.

ADULTERATION OF BONE DUST.

Kandy, April 15th.

Sir,—I beg to enclose copy of a letter from Mr. John Hughes consulting chemist to the Association inviting attention to a new form of adulterating bone dust that has come under his notice, together with the sample referred to.—I am, sir, yours faithfully, A. PHILIP, Secretary.

New Adulteration of Bone Dust.

London, E. C., Feb. 27th.

A. Philip, Esq., Planters' Association, Kandy.

Dear Sir.—As consulting chemist to your Association I should like to direct the attention of your members to a new form of adulterating bone dust which has recently come before my notice. As readers of the *Tropical Agriculturist* are aware Indian bones are now being imported into this country in enormous quantities for the purpose of being used as manure. One firm alone having delivered 40,000 tons during the past year. Samples of these shipments come before me regularly for analysis; and while most of them are of good quality as regards phosphates and nitrogen there are several instances of admixture of sand to the extent of 10 to 15 per cent.

This adulteration however can usually be detected by the dirty appearance of the sample, so that its limits of practice are clearly defined, but the enclosed specimen is of quite a different character, and although having the clean appearance of genuine bone dust it nevertheless contains 10 per cent of adulteration in the form of crystaline carbonate of lime, the presence of which can only be detected by chemical examination, or microscopical inspection. Good bone dust should give no appreciable effervescence with dilute muriatic (hydrochloric) acid, and should present a uniform appearance under the microscope.

On the other hand if you add acid to the enclosed specimen you will notice a marked amount of effervescence as the result of the decomposition of the carbonate of lime; while under the microscope the crystaline appearance of the calcium salt stands out in marked contrast to the organic structure of the particles of bone.

This specimen contained only 47½ per cent of phosphate of lime and 4·06 per cent of ammonia as against 53 per cent phosphates and 4·60 ammonia present in 1st class Indian bone meal.

I trust this information respecting this new form of adulteration as well as the *easy means* of detecting it may be made public for the protection of planters in your island and India against this new fraud of the natives. Shippers of bone dust to this country will do well to take note of it also, and thus spare much disappointment to their representatives on this side who have to make a substantial allowance on all such adulterated deliveries.—Yours faithfully,

JOHN HUGHES.

TEA TRADE WITH FRANCE.

Kandy, April 15th.

Sir,—I beg to enclose copy of a letter from the Secretary to the Ceylon Association in London, transmitting copy of Report, &c., to the Trade and Treaties Committee of the Board of Trade by the Indian Tea Districts Association and the Ceylon Association in London with reference to the Tea Trade with France.—I am, Sir, Yours faithfully, A. PHILIP, Secretary.

4, Mincing Lane, London, March 13th.

The Secretary, Planters' Association, Kandy.

Dear Sir,—I enclose copy of a report made last December, at the request of the Trade and Treaties Committee of the Board of Trade, jointly by the Indian Tea Districts and our own Association.

On Saturday last at the request of the same Committee a deputation from the two Associations went to the Board of Trade and had half an hour's conversation on the subject of the report.

The Indian Association was represented by their President, General Hopkinson, Mr. Tye (Secretary) and Messrs. Benj. White, Stanton and Seton. On behalf of our Association the members present were Mr. Whittall, Messrs. Dickson, Rutherford, Shand and myself.

The Committee were fully represented and asked many questions as to trade in France both in tea and coffee.

Mr. Mundella, who presided, expressed his admiration of the progress made by India and Ceylon in the production of tea and while pointing out that France was not at present proposing to make any change in the tea duty said that if anything could be done that seemed likely to help on the sale of tea in France it should not be overlooked. He did not, however, see at present how any action could be effectively taken.

I enclose a copy of the first report of the Committee which has lately been issued.—I am, yours faithfully,—Wm. Martin Leake, Secretary.

Joint Report to the Trade and Treaties Committee of the Board of Trade by the Indian Tea District Association and the Ceylon Association in London.

1. The importance of the Tea industry to Great Britain has increased considerably during recent years. Tea culture is now carried on so extensively in India and Ceylon that the welfare of this industry is a matter of national importance. Last season's Tea crop from these two places consisted of over 140,000,000 lb. valued in bond in Mincing Lane at £6,125,000. The present season's crop is expected to exceed this quantity by fully 10,000,000 lb.

2. Owing to the rapidity with which Tea production has been extended in India and Ceylon during recent years, it has become of paramount importance to the welfare of the industry that new outlets should be discovered and existing foreign markets encouraged.

3. The consumption of Tea in France is extremely small and has varied very little during some years past, viz. 1884, kilos: 530,664; 1885, kilos: 479,679; 1886, kilos: 552,676; 1887, kilos: 557,162; 1888, kilos: 516,834; 1889, kilos: 540,619.

4. The present high duty of 208 francs par 100 kilos we believe to be prejudicial to the increase of Tea consumption in France.

The total amount realized by the duty (including the surtax) only reached francs 1,249,642 in 1889.

5. Very little loss could thus result to the French Exchequer by reduction in the rate of duty, but in all probability a considerable increase would be gained through additional Tea consumption.

6. The surtax of fcs. 60 per 100 kilos on all Teas imported from places other than the countries of production is onerous because the limited trade in tea in France renders it expedient that small suitable selections should bo provided from England rather than consignments sent direct from India or Ceylon. In 1889 out of a total consumption of kilos 540,619, 200,963 were imported from England.

7. As no tea is grown in French possessions, France can have no reason for protecting the article by a high tariff.

8. In England when the tea duty was 1s per lb. the consumption reached only 88,599,235 lb., and the duty yielded £4,429,961. In the last year of the 6d duty, consumption had increased to 185,578,298 lb. and the revenue to £4,639,457. In the seven months that have elapsed since the duty was reduced to 4d. the Home consumption has increased several million pounds.

9. In endeavouring to foster a trade in British-grown Tea in France both the Indian Tea Districts Association and the Ceylon Planters' Association sunk considerable sums of money at the time of the Paris Exhibition in 1889. These efforts have given sufficient encouragement to induce the Indian Tea Districts Association to incur heavy additional pecuniary liability during the current year.

10. In placing this report before you we do not wish to make suggestions as to the nature of any reduction in the tariff but merely to point out to you

(1st) the imprortance to the British nation of the welfare of the Tea industry; and

(2nd) the benefits which we believe would result to the revenue of France by a less onerous **duty.**

THE MILLING OF PADDY.—Mr. Charles Gairdner, Assistant in the firm of Messrs. Bulloch Bros. and Co., residing at Bassein, and Mr. Robert Ramsay, Engineer to the same firm, have filed specifications of an invention for the more economical milling and cleaning of paddy and other grains.—*Rangoon Gazette.*

CEYLON TEA IN CALIFORNIA.—From a recent Consular report on San Francisco, we quote as follows:—The Ceylon teas introduced here by W. H. Murray & Co. are finding favour. Joseph Tetley & Co., of London, established an agency here recently, and sell a good black tea at 2s 10d per lb. Heretofore black teas, worth in London about 1s 6d per lb. have sold here for 4s to 5s. As there is no duty on tea this is only to be accounted for by the fact that most of the people here drink green tea or coffee.

FAILURE OF A HAMBURG CINCHONA IMPORTER.—The failure has recently been made known of the firm of E. Richter, in Hamburg. The unsecured iabilities of the firm are said to amount to about 200,000*l.* The financial difficulties of the house are reported to have originated through its connections with the firm of Otto Richter (the lato head of which was brother to the chief of the Hamburg house), of Peru and Bolivia, South America Mr. Otto Richter was the principal cinchona planter in Bolivia and the chief grower of the "cultivated Bolivian Calisaya" bark which has been a feature of our cinchona auctions for many years. These plantations were commenced at the time when quinine had not yet reached its zenith and it was an open secret that during tho last two or three years the prices realised by the bark had not paid for its growing, harvesting and shipping. The firm also carried on an extensive trade in other South American products.—*Chemist and Druggist.*

THE SMALL CONSIGNMENT OF PERAK TEA, which we recently announced had been received here, has not been placed publicly on the market. Some experts and others have sampled the lot, and pronounce it of good quality. It is of good colour, though slightly strong, and brews out well; it will bear comparison with equal growth of India and Ceylon.—*L. and C. Express.*

MOSQUITOES AND YELLOW FEVER.—I am not at all partial to mosquitoes and regret that no 'reciprocity' exists in that direction between us, especially at the present moment when some twenty of these miniature vampires, are making an off-and-on dinner upon my person. Why they were created is one of those problems which may be explicable enough to the scientist, but is quite unfathomable to commonplace beings such as I. Nevertheless some use has been found for them at last, and that so near us as Cuba. Two physicians of Havana are busy at present inoculating, successfully, new arrivals against yellow fever through mosquitoes that have contaminated themselves by stinging yellow fever patients. Fifty-two cases of mosquito inoculation have been followed up and of those 8 per cent subsequently contracted the disease with a mortality of less than two per cent.—*Jamaica Gleaner*, March 9th.

CEYLON EXPORTS AND DISTRIBUTION, 1891

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total	Cinchona 1891 B'nch & Trunk lb.	Tea 1891 lb.	Cocoa cwt.	C'moms. lb.	Cinnamon Bales lb.	Cinnamon Chips lb.	Coconut Oil 1891 cwt.	Coconut Oil 1890 cwt.	Pl'bag 1891 cwt.
To United Kingdom	20583	...	20583	1447370	18451772	8937	44210	318495	31003	21809	...	43057
,, Marseilles	...	33	33	...	9091	39	...	35100	...	...	...	...
,, Barcelona	...	...	...	..	3300	...	...	36000	...	...	...	...
,, Genoa	...	...	...	..	100	...	...	38700	14000	203	394	...
,, Venice	..	...	...	...	...	...	...	...	5600	...	...	...
,, Trieste	3672	16	3688	...	210	...	...	2100	3370	951	600	...
,, Odessa	...	...	...	...	...	...	...	...	...	1001	..	...
,, Hamburg	1	...	1	...	5065	77	1141	82975	42000	3816	501	8801
,, Antwerp	18	...	18	26062	50	...	...	7500	...	804	...	3094
,, Bremen	1	...	1	...	1789	..	...	...	...	...	...	...
,, Havre	...	...	...	3362	...	...	...	...	...	...	...	...
,, Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	10	...
,, Africa	35	...	35	...	19393	...	..	...	...	...	...	...
,, Mauritius and Eastward	14	...	14	...	23088	84	...	20168	...	1025	14049	...
,, India	918	1471	2389	...	36929	...	55517	14528	...	29658	11511	10
,, Australia & New Zealand	2046	347	2393	...	660456	...	40	1000	4200	603	1029	...
,, America	154	...	154	141545	31813	1049	...	12000	...	32347	4001	68726
,, Stockholm	...	...	...	...	300	...	...	...	...	...	...	...
,, Constantinople	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 20th April 1891	27442	1867	29309	1640377	19243156	10186	100908	568566	100173	92217		123688
Do 1890	43963	1063	45026	2288184	1651352	7446	133320	517714	90504	32095		99794
Do 1889	26672	2605	29277	2993960	8515545	7136	108523	940967	150511	99626		129755
Do 1888	66414	1795	68208	3299212	4774281	6627	111984	360149	349735	122810		71217

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, April 9th, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
ALOES, Socotrine	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic	Common and good ...	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red...	Renewed	2d a 1s
	Medium to good Quill...	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a $1\frac{1}{2}$d
BEES' WAX, E.I., White	Good to fine	£6 a £7
Yellow ...	,, ,, ...	95s a 115s
Mauritius & Madagascar...	Fair to good	115s a 130s
CARDAMOMS—		
Allepee	Fair to fine clipped ...	1s a 2s 2d
Mangalore	Bold, bright, fair to fine..	1s 6d a 3s
Malabar	Good to fine plump, clipped	2s a 2s 6d
Ceylon, Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s 3d a 1s 6d
	Small to bold brown ...	1s a 1s 6d
Alleppee and Mysore sort	Fair to fine bold ...	2s 6d a 3s 11d
	,, ,, medium ...	1s 6d a 1s 10d
	,, ,, small ...	1s a 1s 4d
Long wild Ceylon...	Common to good ...	3d a 2s 2d
CASTOR OIL, 1sts	White	$1\frac{1}{2}$d a $4\frac{7}{8}$d
2nds	Fair and good pale ...	3d a $3\frac{1}{2}$d
3rds	Brown and brownish ...	$2\frac{3}{4}$d a 3d
CHILLIES, Zanzibar ...	Fair to fine bright ...	70s a 75s
	Ord'y. and middling ..	60s a 65s
CINNAMON, 1sts	Ord'y. to fine pale quill...	$7\frac{1}{2}$d a 1s 2d
2nds	,, ,, ,, ,, ...	7d a 1s
3rds	,, ,, ,, ,, ...	$6\frac{1}{2}$d a 10d
4ths	Woody and hard	$5\frac{3}{4}$d a 7d
Chips	Fair to fine plant ...	2d a $6\frac{1}{2}$d
CLOVES, Zanzibar and Pemba.	Fair to fine bright ..	$3\frac{7}{8}$d a 4d
	Common dull and mixe	$3\frac{1}{2}$d a $3\frac{3}{4}$d
,, STEMS	Common to good ...	$\frac{7}{8}$d a 1d
COCULUS INDICUS ...	Fair sifted	12s a 13s
COLOMBO ROOT... ...	Good to fine bright sound	22s 6d a 28s 6d
	Ordinary & middling ..	16s a 20s
CROTON SEEDS, sifted...	Fair to fine fresh ...	10s a 15s
CUTCH	Fair to fine dry ..	24s a 32s 6d
DRAGONS BLOOD, Zanzibar ...	Ordinary to good drop ...	50s a 90s
GALLS, Bussorah & Turkey ...	Fair to find dark blue ...	52s 6d a 57s 6d
	Good white and green ...	40s a 50s
GINGER, Cochin, Cut ...	Good to fine bold ...	70s a 75s
,, ...	Small and medium ...	41s a 52s
Rough...	Fair to fine bold ...	32s 6d a 37s 6d
,, ...	Small and medium ...	25s a 30s
Bengal, Rough	Fair to good	9s
GUM AMMONIACUM ...	Blocky to fine clean ...	20s a 50s
ANIMI, washed ...	Picked fine pale in sorts	£11 a £13
	Part yellow & mixed do.	£10 a £11
	Bean & Pea size ditto ...	£5 a £7 10s
	Amber and red bold ..	£10 a £12
scraped...	Medium & bold sorts ..	£5 10s a £11
ARABIC E.I. & Aden ..	Good to fine pale frosted sifted	50s a 80s
	Sorts, dull red to fair ..	35s a 55s
Ghatti ...	Good to fine pale selected	45s a 55s
	Sorts middling to good...	23s a 33s
Amrad cha.	Good and fine pale ...	60s a 107s 6d
	Reddish to pale brown ...	25s a 50s
Madras ...	Dark to fine pale ...	15s a 50s
ASSAFŒTIDA	Fair to fine pinky block and drop	35s a 80s
	Ordinary stony to midling	20s a 28s
KINO	Fair to fine bright ...	40s a 43s
MYRRH, picked	Fair to fine pale ...	£6 a £8
Aden sorts	Middling to good ...	70s a 80s
OLIBANUM, drop...	Fair to fine white ...	35s a 56s
,,	Reddish to middling ...	22s 6d a 32s 6d
pickings...	Middling to good pale ...	12s a 18s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER	Red hard clean ball ...	2s [illegible]d a 2s 6d
East African Ports, Zanzibar and Mozambique Coast	White softish ditto ...	1s 8d a 2s 3d
	Unripe root	1s 3d a 1s 11d
	Liver	1s 6d a 2s 2d
	Sausage, fair to fine ...	2s a 2s 2d
Assam,	Good to fine ...	2s a 2s 8d
	Common foul & middling	1s a 1s 10d
Rangoon	Fair to good clean ...	2s a 2s 3d
Madagascar, Tamatave, Majunga and Nossibe	Good to fine pinky & white	2s 5d a 2s 10d
	Fair to good black ...	2s a 2s 3d
ISINGLASS or FISH MAWS Tongue..	good to fine pale ...	3s a 3s 10d
	dark to fair ...	1s a 2s 6d
Bladder Pipe...	Clean thin to fine bold...	1s 6d a 3s 7d
Purse ...	Dark mixed to fine pale	$6\frac{1}{2}$d a 1s 8d
Kurrachee Leaf ...	Common to good pale ...	1s 9d a 3s 10d

EAST INDIA Continued East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS
INDIGO, Bengal ...	Middling to fine violet ..	4s 6d a 6s
	Ordinary to middling ...	3s 6d a 4s 3d
Kurpah	Fair to good reddish violt	3s a 3s 7d
	Ordinary and middling...	2s 3d a 2s 10d
Madras (Dry Leaf)	Middling to good ...	2s 8d a 3s 2d
	Low to ordinary ...	1s 8d a 2s 6d
IVORY—Elephants' Teeth		
60 lb & upwards ...	Soft slightly def. to sound	£69 a £76 10
over 30 & under 60 lb.	,, ,,	£64 a £72
40 a 100 lb. ...	Hard ,, ,,	£49 10s a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,, ...	Hard ,, ,,	£25 a £33 10s
Billiard Ball Pieces $2\frac{1}{4}$ a $3\frac{1}{4}$ in	Sound	£78 10s a £83 10s
Bagatelle Points ...	Sli. def. to fine sound ...	£66 a £75
Cut Points for Balls	Shaky to fine solid sd.	£55 a £73
Mixed Points & Tips...	Defective, part hard ...	£31 a £53 10s
Cut Hollows ...	Thin to thick sli, def to sound	£30 10s a £57
Sea Horse Teeth— $\frac{2}{8}$ a $4\frac{1}{2}$ lb.	Crvd. crkl & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Bhimlies I, good & fine pale	12s 6d a 14s
	,, II, fair pickings	9s a 10s 6d
	Jubblepore I, good & fine	12s a 13s 6d
	,, II, fair rejections ...	9s 6d a 10s 6d
	Vingorlas, good and fine	9s 6d a 11s 6d
Madras, Upper Godavery	Good to fine picked ...	11s a 12s
,, ,, ...	Common to middling ...	9s 6d a 10s 6d
Coast	Fair	10s a 11s
Pickings ...	Burnt and defective ...	8s a 9s 9d
MACE, Bombay ...	Dark to good bold pale...	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,, ...	64's a 80's	2s 8d a 3s 1d
	83's a 180's	1s 6d a 2s 7d
NUX VOMICA Cochin, Madras and Bombay	Fair to fine bold fresh	11s a 14s
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour..	$\frac{5}{8}$d a $\frac{3}{4}$d
LEMONGRASS ...	,, ,, ,, ...	$1\frac{1}{2}$d a $1\frac{3}{4}$d
ORCHELLA WEED Ceylon ...	Mid. to fine, not woody	20s a 25s
Zanzibar ...	Picked clean flat leaf ...	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER—		
Malabar, Black sifted ...	Fair to bold heavy...	$4\frac{3}{4}$d a 5d
Alleppee & Tellicherry	,, good ,, ...	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO, Lump ...	Fair to fine bright bold	15s a 21s
	Middling to good small...	11s a 14s
Chips ...	Sli'tly foul to fine bright	9s a 12s
Dust ...	Ordinary to fine bright...	4s 6d a 7s 6d
RED WOOD	Fair and fine bold ...	£3 a £3 10s
SAFFLOWER, Bengal	Good to fine pinky ...	50s a 60s
	Ordinary to fair ...	25s a 45s
	Inferior and pickings ...	15s a 25s
SALTPETRE, Bengal ...	Ordinary to good ...	16s 6d a 17s
SANDAL WOOD, Logs	Fair to fine flavour ...	£35 a £60
,, ,, Chips..	Inferior to fine ...	£9 a £30
SAPAN WOOD	Lean to good bold ...	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 70s
SENNA, Tinnevelly ..	Good to fine bold green...	6d a 8d
	Medium to bold green...	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a $1\frac{1}{2}$d
Bombay ...	Ordinary to good ...	1d a 2d
SHELLS, M.-o'-P. ..	EGYPTIAN—med. to large	[illegible]8s a 100s
	small and medium.	90s a 100s
	oyster and chicken	55s a 100s
large	BOMBAY—fine thick ..	50s a 85s
medium stout ..	bright fairly clean	95s a 102s 6d
chicken part stout	,, ,, ,,	85s a 95s
oyster part thin ..	,, ,, ,,	70s a 82s 6d
Mussel ...	medium to fine bold	45s a 60s
Lingah	sorts...	3s a 10s
TAMARINDS ...	Mid. to fine blk not stony	12s a 6d 15d
	Stony and inferior ...	4s a 6s
TORTOISESHELL ...	Fair & fine clean heavy	16s a 25s
Zanzibar and Bombay	Low thin to mid. clean	5s a 15
TURMERIC, Bengal ...	Leanish to fine plump finger	14s a 15s 6d
Madras ...	Fin. fair to fine bold brgt	16s 6d a 18s 6d
,, ...	Mixed middling... ...	15s a 16s
,, ...	Bulbs	10s a 12s
Cochin ...	Finger	13s a 14s
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in.	12s a 20s
Mauritius, 2nds...	Foxy & reddish 5 to 8 in.	9s a 14s
Seychelles, 3rds...	Lean & dry to mid. under 6 in. ...	6s a 8s 6d
Madagascar, 4ths...	Low, foxy, inferior and pickings... ...	3s a 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for May :—

"OILY AND FATTY MATTERS IN PLANTS."

IN dealing with the oily and fatty matters found in plants, we would best leave out for the present those oils known essential oils, a consideration of which will be taken up further on: the term oils will therefore for the present indicate true oils, or as they are variously named fatty, greasy, or fixed oils. Fats and oils fall under the large head of organic compounds known as carbo-hydrates, that is compounds consisting of carbon, hydrogen, and oxygen, in which the hydrogen and oxygen exist in the proportion required to form water. They are all glycerides, or normal compound ethers of glycerine, and can be formed by the action of an oily or fatty acid on glycerine. The most important glycerides are stearine, palmitine, oleine and linoleine; the two former are white solids melting at 160° F. 142° F. respectively, the two latter are liquids. The ordinary fats—such as suet, lard, tallow—are mixtures of stearine, palmitine and oleine, in various proportions. The more stearine there is present, the harder and less fusible the fat; the more oleine, the softer and more fusible is it. Olive oil contains palmitine and oleine; almond oil, oleine with a little palmitine; linoleine occurs in linseed oil, hemp seed oil, poppy seed oil and other "drying oils," which when exposed to the atmosphere absorb oxygen, and are converted into a solid varnish. Castor oil consists almost entirely of ricinoleine. One of the main differences between fatty and oily matters is, it will be seen, in their consistency, which is regulated by the proportion of the compounds composing such substances. Oily and fatty matters in plants are numerous and widely distributed; nearly all plants containing one or more. Even cereal grain s—as oats and maize—contain oil in appreciable quantities. Some plants contain waxy substances which give the bloom or shine to different parts of them. Again, some oils contain phosphorus, and are called phosphorised oils; such are the oils got from lupines, peas, and horse-beans. Fatty and oily matters are found in different parts of plants, but principally in the seed—as cotton-seed, linseed, sunflower-seed, &c. They are extracted by pressure, and the quantity obtained varies from ten to seventy per cent of the weight of the seed. Oleine is one of the commonest constituents of vegetable oils. Palmitine is found in palm oil, butter, and bees wax.

The essential oils differ greatly from the true or fixed oils, both in properties and in chemical composition. Unlike the latter they are volatile, non-lubricating, and possess powerful odours. They are obtained from many plants by distillation with water, the oil coming over with the water, and collecting in the receiver, partly dissolved in the water, partly floating on its surface, the watery solution having the odour of the oil. In this way oil (or attar) of roses and rose water, oil of lavender and lavender water, oil of cinnamon and cinnamon water &c. are prepared. Many of these oils, so different in odour, have the same composition as oil of turpentine, *e.g.* oil of lemons. Others contain various volatile substances; such are oil of mustard, and oil of bitter almonds, the latter containing the poisonous principle—hydrocyanic or prussic acid.

Of the true oils produced in Ceylon, the most important is coconut oil which is expressed from the dry kernel (copra) of the coconut by means of the ordinary native mill or checkko, and in a few cases by machinery: the oil specially intended for cooking purposes is however principally got by boiling the scraped kernel, while the clear hair oil made from the king-coconut is generally prepared from the scraped kernel by means of sun heat only. The ordinary oil which is largely exported, is used abroad for the manufacture of candle and soap. Soap is also manufactured to a small extent in the Island, and we were rather surprised by the enquiry for this "Ceylon coconut oil soap," as it was called, by passengers

f a French steamer who claimed for it the property of easy solubility in sea-water. Saponification or the process of soap-making is brought about by treating fatty or oily acids with caustic soda or caustic potash—the result being the production of a potassium or sodium salts of the fatty or oily acids, these consisting soaps. Hard soap has soda, soft soap has potash as a base.

Margosa or Kohomba oil is extracted from the fruit of the Nim or Margosa tree. This oil is largely used in Native medical practice. Gingelly oil is got from the gingelly or sesamum plant. Kekuna oil is expressed from the nuts of the kekuna tree, which contains about 50 per cent of oil. This oil is also exported, and is used in soap manufacture. Caju oil is expressed from the caju or cashew nut which contains about 4 per cent of oil. Mi oil is got from the fruit of the mi tree, and is used in native medicine. Castor oil from the castor plant is also produced in Ceylon to some extent.

Of essential oils, the principal is—Cinnamon oil distilled from the chips, bark, and in some cases from the leaves of the cinnamon plant. It is exported to a fairly large extent, and is used in medicine and for perfumery.

Citronella oil is distilled from citronella grass, and is exported for use in perfumery and for scenting soaps and pomatums.

Lemon grass oil, distilled from lemon grass, is made use of in the same manner as citronella oil, and to a large extent in the preparation of Eau-de-cologne.

Other less important oil-producing plants found in Ceylon are Mustard, Croton, Domba, Na (ironwood), Cotton, Pulun (tree cotton), Kon, Groundnut, Sunflower, Malabodda, Duhudu, Wetaerandu, Dorana, Murunga, and Kina.

OCCASIONAL NOTES.

It is with pleasure we have to record the fact of a new prospect being opened out to the students of the School of Agriculture. A Sinhalese gentleman, who is a large landowner of wealth of standing—but whose name we have no permission to publish—has signified his intention of employing agricultural students who have passed through the School of Agriculture with credit, on his estates, whenever he is in need of Superintendents. He offers liberal terms, and gives his intended employees an opportunity of becoming acquainted with the technicalities of the cultivation of special products before taking up the reins of office into their own hands. This offer opens out a happy prospect to those who are neither fortunate enough to be selected for Government employ as agricultural instructors, nor have facilities for carrying on cultivation on their own account.

Some time ago we referred to the advantages of employing passed students of the School of Agriculture, as pointed out by a private employer of one of our students. It cannot be doubted that the training, theoretical and practical, and the discipline under which the students are brought at this institution will result in making more intelligent and reliable superintendents and conductors of private estates than are found among the ordinary place-seekers of this description. We have more than once heard of a conductor, who as the result of confusion in his mind with regard to his instructions, has gone ahead working as hard as ever in a wrong direction in blissful ignorance he was doing damage (that was hardly to be remedied except at the cost of much time, expense and labour) to his master's property or crop. Now the average agricultural student can at least be trusted to exercise a good deal of discretion on his own account, and to bring the principles he has been taught in his class-room to guide him in a critical moment.

We will not dilate further on this subject for fear of being credited with a partiality for advertising ourselves. It is, however, a very gratifying matter to find gentlemen, such as the new patron of the School of Agriculture, appreciating the results of the work done here, and encouraging agricultural students by the liberal offers they make.

Why, it has been asked, is not all the teaching at the School of Agriculture carried on in Sinhalese instead of in English? True that by far the greater number of the students are Sinhalese, yet there are generally four or five Tamil students—the Burgher community having been for the past three years represented by one—to whom it would be a manifest disadvantage to be taught in Sinhalese—especially as the men from Jaffna and Batticaloa have so far proved themselves keen students of agriculture, and have always shown a determination to carry on agricultural work after leaving school. There is another objection in the difficulties that would come in the way of a lecturer or teacher doing justice to his subject in the Sinhalese language. If both masters and students were excellent Sinhalese scholars, these difficulties would tend to diminish in a degree; but yet it would be a hard matter to find expressions in the Sinhalese language that would exactly convey the meaning of scientific terms which crop up both in agriculture and the allied sciences taught at the school. It must at the same time be remembered that both the Sinhalese and Tamil languages are freely drawn upon to explain words or expressions whenever such a need arises. On the whole, therefore, it will be admitted that English has advisedly been chosen as the medium through which students should be instructed in agriculture at this school.

In Dr. Kynsey's address before the Ceylon Branch of the British Medical Association, the following appears among the "desiderata for improving the sanitary condition of the country and the well-being of its inhabitants":—"There should be a Veterinary department for the study of the diseases of animals. I believe much loss in the country districts could be saved to farmers by timely treatment of sick cattle, and by early destruction when they are suffering from contagious disease."

In addition to this, one might add another distinct advantage, from a Veterinary Department, and that is that there will be a number of men, qualified to inspect cattle and meat *as they should be inspected*, available for employment as inspectors of slaughter-houses and meat-markets.

The Grama Rakshaka Samagama held what was really their first Agricultural Show on Monday the 27th April at Dalugama; and if the Society does not meet with any serious difficulties—too common, alas, in the case of societies and associations in this country—and grows and extends its influence at a rate at which we can only hope it will, then will this date be a memorable one. The interesting features about the Show at Dalugama was that it was intended solely for the encouragement of native industry and enterprise, and that its object was purely a philanthropic one. For this reason it is unique in our agricultural record, for hitherto, however well the products of the soil have been represented at Agricultural and Horticultural Shows, one cannot help thinking that these Shows were merely nuclei round which to gather a deal of less useful and more frivolous amusement. They always lacked the real business air about them. We heartily congratulate the Samagama (and especially the Secretaries) on the signal success which characterized their first attempt at holding a Show. Agricultural Shows are very important agents in creating a healthy competition, as well as being incentives to industry; but if such Shows are to be held more frequently as has been proposed by the Government Agent of the Western Province with other recommendations worthy of attention—it would be well if, to a great extent, they were "built" on the excellent little model we saw at Dalugama last month.

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Rubiaceae.

49. *Hedyotis Auricularia,* L. Sin. Getakola, is a slightly woody spreading herb. This plant is commonly met with growing wild in waste lands and cultivated places. Its slender stem with many branches is swollen at the nodes. The leaves are small, green, and of an ovate shape. The flowers are very small and are borne at the nodes, where the small fruits are also produced.

The leaves of *H. Auricularia* are used in preparing a dry curry, but it is not much used as a food. The plant is believed to possess cooling properties, and is used to some extent by native medical practitioners in treating cutaneous diseases.

50. *Ixora Coccinea.* L.,

is a tree found throughout the Island, growing in both cultivated and uncultivated land. It is abundantly found in the vicinity of streams. The general growth of the plant is a shrub, but it is also found as a tree with well-defined large stems. The stem is much branched and covered with green leaves of an ovate shape, and of a rather leathery texture, the viens being slightly prominent. The flowers which are red with a thin tubular corolla expanded into four petals, are borne in large clusters, which give a characteristic appearance to the trees. A large quantity of nectar is found in the flowers of ixora. The fruits which are borne in clusters are of the shape and size of Ceylon black berries (Dan). They are green and have an astringent character when immature, but turns soft in texture and black in colour when ripe. The ripe fruits are of a sweetish taste, and are often eaten. The wood of this plant is of a hard texture, but as it does not generally attain to a great height, its timber is not much used except for handles of mamoties and other agricultural implements. The flowers of this plant are reputed to contain properties of purifying the blood.

Compositae.

51. *Emilia Sonchifolia.* D. C. Sin. Kadupara, is a herb found growing in the warmer parts of the Island in cultivated gardens and waste places. It has simple amplexicaul leaves with divided margins. The whole leaf is of a light green colour and is covered with glossy hairs. The leaves are found to vary according to the fertility of the soils where they grow as well as according to the condition of the climate. The flower-heads are small in size and are borne on a slightly long peduncle.

The leaves of this herb are used as a vegetable. They have a slightly acid character, and when made into curries this acidity gives the preparation a pleasant taste. The leaves are said to possess cooling properties, and are used externally in cuts and wounds and also in cases of serpent bites.

Sapotaceae.

52. *Bassia Longifolia.* Sin. Mi.

This is a tree which grows in the warmer parts of the Island up to high elevations. It attains to very large dimensions, and is covered with dense foliage. The leaves are long and narrow; their margins are entire; and the veins are prominent. The leaf is of a tough texture. The flowers are borne in abundance. They have thick fleshy calyces and are of a whitish appearance, with a peculiar smell. The Bassia trees flower once a year during the months of May and June, when in many parts of the Island trees are laden with blossoms and the ground strewn with the flowers, while large swarms of bees always resort to the trees at this season. The fruits are formed in July and August, and they much resemble the fruits of the small varieties of mangoes both in their appearance and in their arrangement on the trees. A fruit generally contains two seeds, but it is not uncommon to meet with those containing three to four of them. The fruits when ripe are much liked by birds, especially parrots and flying-foxes. The seeds are about an inch in length tapering both ways and thick in the middle: they are covered with a smooth brittle integument.

The seeds contain a large quantity of oil in them, which is extracted by the villagers.

A sugary syrup is manufactured by boiling the juice of the bassia flowers, and is used in the preparation of sweetmeats. This syrup has rather an unpleasant taste and smell, to those who are not accustomed to its use. The dried flowers are pounded and made into flour which is also converted into sweetmeats.

The fleshy portion of the young fruits of the Bassia is cut into slices and made into curries. Bees collect large quantities of honey from the flowers for their hives. The timber of this tree is used in house building as well as in the

construction of bridges. The juice of the Bassia leaves along with coconut milk is used in cases of burns and for allaying rheumatic pain. The astringent bark is used in fever and also to promote apetite. The oil extracted from the seed is used externally.

AGRICULTURE IN THE NORTH.

Sir,—Since the abolition of the tax on dry grains, many suggestions have been thrown out with a view to encouraging a more extended cultivation of these products; and it is gratifying to read that the Agriculturists of the North are as busy as ever preparing their lands for these crops, and that in all likelihood a good outturn will follow. This is very encouraging news to those who are interested in the affairs of Jaffna, and it is all the more cheering after the late reports of the failure of the paddy crop. When the tax was about to be abolished, it used to be thought that such a relief will bring about a careless and indifferent disposition in the cultivation of dry grains. Happily the reverse has been the case!

The Jaffna cultivator needs no instruction or direction for the raising of dry grains, for the reason that by long experience he has arrived at the most improved methods of cultivating such products; but where he does need help and special guidance is in fruit culture and gardening, for which, though he has a soil of great capabilities, he has little taste and enterprise himself. While thinking over the opportunites for improvement in this direction, by a strange coincidence the *Ceylon Patriot* of the 10th instant, suggested in its columns the idea of establishing Experimental Gardens throughout the Island, and specially recommended the formation of a Board of Agriculture in Jaffna. The *Patriot* goes on to say that "A competent Agriculturist should be in charge of each garden nominally under his local superior, the Government Agent, but responsible to the Director (of the Peradeniya Botanic Gardens); and these professional men attached to these gardens should, in addition to keeping their gardens in the highest state of efficiency, try their utmost to spread a knowledge of the improved method of cultivation, and send annual or quartely reports to the Director as to the state of their gardens, with remarks and suggestions of their own, as to the economic plants and vegetables suitable to the soil of their gardens, putting in their requisition for such plants as are not obtainable locally and generally; keeping the Director duly informed of every thing which in his opinion will be of benefit to the people. Now that through the laudable exertions of Mr. Green, a batch of graduates are annually turned from the Agricultural School, with a competent knowledge of their subject, their services can be engaged for a trifling sum compared with the enormous expense necessary to get down Agriculturists from England or the Continent."

With regard to the Board of Agriculture, the *Patriot* delivers itself as follows:—

"Devoid, though he (the Government Agent) be of scientific knowledge and training, he will be the means of doing great good if guided by a competent and responsible Agriculturist. The whole force of headmen can be held in leading strings and made *nolens volens* to spread a knowledge of improved gardening and cultivation of economic plants throughout their respective divisions. To aid the Government Agent and advise him in all important matters, the formation of a Board, consisting of the chief headmen of Jaffna and a few of the leading landed proprietors, independent of Government, will be a very desirable step.

It may thus be inferred from these remarks of the *Ceylon Patriot*, representing as it does the interests of the Tamil community of the North, that the inhabitants of the Jaffna Peninsula are not reluctant to adopt any useful plan that may be suggested and appear practicable.

One good result such a system as the *Patriot* suggests will be the breaking down of a good deal of selfishness and conservation that clings to the northern cultivator. Take for instance the growing of grapes which is so limited in extent, for the main reason that the secret of their successful cultivation is jealously kept by a few who are loth to proclaim it to their brethren. In this connection I may mention the advantages of such a publication as the Magazine of the School of Agriculture, in which there is at present appearing a useful contribution on the cultivaof the Grape Vine.

Again, in the case of cucumber, cultivation is also confined to a comparatively few. The variety grown here has proved itself a profitable crop, and one for which there is an eager demand in the market, but its more extended cultivation is prevented by unworthy means (such as withholding seed or supplying bad seed) for fear that the result might be a disadvantage to a few favoured but selfish individuals.

It will thus appear that it is vey desirable that by some means,—whether through the School of Agriculture in Colombo or the Board of Agriculture at Jaffna,—a more liberal system of cultivation should prevail in the North, that there should be no obstacles in the way of procuring whatever seed is required, and that opportunities should be allowed for the existence of a healthy competition, which is one of the fundamental laws of Agricultural Industry.

I am very anxious that some effort should be made to establish these desirable results, which I doubt not will have the sanction of the Government Agent of the North (himself a successful cultivator of fruits), and it is for that reason that I have touched on the plan put forward in the *Ceylon Patriot*, and endeavoured to supplement and strengthen its remarks in urging the claims of Jaffna for more enlightened direction and supervision of its agricultural affaris.

I am, yours, &c.,
R. C. Muttiah.

Colombo, 18th April 1891.

THE CULTIVATION OF MANIOC.

(*Manihot Utilisima.*)

By W. A. De Silva.

The Manioc belongs to the order Euphorbiacea and thrives in warm regions. The original home of the Manioc is considered to be the New World, whence it has been introduced into eastern countries. The plant is in great repute wherever it is cultivated on account of the large quantity of food materials it produces in

a given space of land, when compared with other food products. Its introduction to Ceylon is attributed to the Dutch, who by the way have the credit of having introduced many useful food products which are commonly grown in the villages at the present day. According to Dr. Ainslie, the manioc plant was brought to Ceylon from Mauritius by Governor Van der Graff in the year 1787; and thus it will be seen that the plant has been in cultivation in this Island for over a century. This plant, like the other plants of the same family, possesses acrid properties, in addition to its containing a small percentage of hydrocanic acid. The characteristic smell of the cyanides being quite perceptible.

It has been found that there are above thirty different varieties of manioc grown all over the world, but these are considered to be only slight variations of two distinct species, *Manihot Utilisima* and the *M. Aipi*, the bitter and the sweet manioc respectively. The former variety has certain poisonous properties in it, in a raw state, while the roots of the latter are quite sweet and harmless. These varieties could be distinguished from their outward appearance by observing the leaves. The leaves of the bitter manioc have seven divisions, and the veins on the under surface are coloured red; whilst the sweet manioc possesses leaves with five divisions of a pale green colour.

So far as I have seen both these varieties are found in Ceylon, but the variety generally cultivated is a slightly modified type of the *Jatropha Utilisima*, the bitter manioc. 'In all countries this variety is preferred because it yields more abundantly. The bitter principles and poisonous characters of its roots are removed by drying or boiling.

The cultivation of the manioc plant is carried on to a large extent in the Western and North-Western districts of Ceylon. In many other districts it has rather a bad reputation as a food product on account of the poisonous properties which the fresh roots of some of the varieties possess, and on account of frequent deaths which occur by the careless use of the root.

The manioc is grown both in chena lands and in new clearings for coconut. It forms a very paying subsidiary crop along with the latter.

The plant is propagated by cutting the stems which give out buds from almost every node. In cultivating manioc, the land is prepared by hoeing and burning. Shallow holes are made with a mamoty four feet apart, or sometimes five, and two pieces of manioc cuttings from nine to ten inches long are placed in the holes and slightly covered with earth. These give out a large number of buds which grow with much rapidity. In planting manioc advantage is taken of a few slight showers, but when growing they are able to stand much adverse weather. The trees generally reach a height of from eight to ten feet, and after ten months they could be rooted out. The yams vary very much in size, and weigh from four to fifty pounds each. In good lands, the quantity of manioc produced is very large, but the average may be calculated at fifteen pounds per tree.

(*To be continued.*)

REFUSE MATTERS AS MANURES.

Horns, skin, hair, hooves and feathers are all of some value as manure. They are highly nitrogenous substances,—the amount of nitrogen present being the test of their value,—though they are very tardy in their action in the soil. Skin and hooves are not so refractory as the others mentioned; while feathers are particularly slow in decomposing. Skin refuse from tanneries when fresh is very valuable, but it is found often mixed with pieces of tanned leather which decompose very slowly. When made into composts, these substances decompose faster, and become much sooner available as plant food. Sulphuric acid is sometimes used for acting on them, and superheated steam is also employed; the great disadvantage in this latter process being the loss of ammonia which occurs with the escaping steam. For use in slow-growing crops the above are by no means to be despised. Blood as a waste material from slaughter-houses, is a highly nitrogenous manure and decomposes comparatively easily, while it is not easily lost by the soil. It is best applied after being dried and reduced to a powder, mixed with bone or other phosphatic manures.

Ashes from burnt wood, especially young twigs, contain a large amount of potash. Animal charcoal—the refuse from sugar manufactories,—is an excellent source of phosphoric acid, and should be applied ground for the best results. It is sometimes used for making superphosphate by the action of sulphuric acid. Soot which essentially consists of firmly-divided carbon and mineral matter, is valued for the fair proportion of ammonia which it also contains. Soot, besides supplying ammonia, absorbs gases and saline matter, while, by darkening the soil, it raises its temperature.

Gas lime—the refuse from gasworks—should not be used fresh, but must be exposed to the atmosphere for some time before applying.

Gas liquor might with advantage be used for saturating saw dust and coir dust to facilitate distribution.

Many of the refuse substances mentioned above are used by manufactners for making up artificial manures which are sold in the market under various names. The term guano has been used to designate many of these prepared manures. For instance, European guano, which is a very fair manure, is made up of blood, horn, urine, &c. that have been acted upon chemically, and converted into a powdery fertilizer. Frey Bentos guano owes its origin to Liebig's Extract of Meat Company, and is manufactured from the meat refuse into a good manure.

Fish guano, a nitrogeneous manure, much used in Scotland, is made out of the refuse from sardine and other fish-tinning works in Norway. Native guano, which can be traced back to sewage precipitation is, however, not held in much estimation. It will thus be seen that while a great deal of refuse matter is allowed to go to waste with us, it is used to advantage in other countries for making manures of a fairly soluble character, and convenient form for application to the land. The least that might be done by native agriculturists, who think so little of making a return to the soil they cultivate, is to form composts of such refuse matters as are available in towns,

for use on their lands. In this they have an example in the indefatigable Tamil grass-cultivator who will carry away whatever refuse matter he can lay his hand on—often of a useless nature—to place on his land.

AGRICULTURAL LITERATURE AMONG THE ANCIENT INDIANS.

By W. A. De Silva.

The diseases which attack vegetation are also dealt with by ancient Hindus, and particularly in the works referred to in my previous contribution. One cause of disease is stated in the following passage:—"Cold winds and scorching sun produce diseases in trees, and the trees turn light in colour and do not put forth new leaves, while the branches become dry and the sap leaves the tree."

The remedies given to meet these results, as well as the recommendations for producing luxuriance in growth, and inducing plants to flower and fruit freely, while they in some cases include measures by no means antagonistic to our modern ideas, generally indicate means, the adoption of which would in these days be considered the height of the ridiculous.

"To cure the plant of these diseases," says this ancient writer on vegetable Pathology, first scrape of or otherwise remove with the knife, the parts found dead on the tree; rub over these parts a mixture of Erycibe Paniculatum (a plant possessing the properties of a vermifuge), ghee, and mud; and pour at the roots water mixed with milk. If the fruits are inclined to wither, take a mixture of horse-gram, black-beans, sesamum seed and barley, and pour it at the roots:—this will bring about an increase of both flower and fruit. But here are yet more startling recommendations:—"To make trees fruit and flower abundantly, mix two measures of the excrement of the goat and ram with one of sesamum seed, half of rice flour, one measure of water and a hundred tulas or nearly a pound of cow's flesh; keep the mixture for seven days, and then water, creepers, plants, and trees."

A special compost for increasing the size of plantains is the following:—"Use as manure for the roots of the plaintain the excrement of the ass and the horse, burning dry twigs over the roots: the plaintains will produce fruit as big as the trunk of the elephant.

For increasing the size of yams:—"Dig a pit and burn inside it the dung of the cow and the hog; remove the ashes and fill the pit with earth. The root of the yam will be found to grow to a size sufficient to fill the pit!"

For producing a luxuriant growth:—"Mix with milk the marrow of the fish and the hog, as well as their flesh. Soak the seed of the plant in the mixture, dry it and expose it to the vapour of smoking ghee. The seed when sown will be found to spring up in an unusual and wonderful manner."

These quotations suffice to give one an idea of the nature of plant treatment in ancient works touching on agriculture. Absurd as many suggestions found in them seem to be, it will be noticed that nearly all the prescriptions greatly favour the use of organic manures for stimulating growth, such as carion, blood and milk. Both the first and second are not to be despised as manurial agents. A carcase is always an acquisition on cultivated land, and what is a loss to the stock-owner is a gain to his soil and the plant; while there are manures in the market which may be called "Meat Manures," for instance that prepared from the refuse matter in Liebig's Extract of Meat Company. In milk we have the most perfect food, as much so for the plant as for the animals, and though it seems ridiculous enough to use meat and milk for manuring plants, yet it must be borne in mind that the population of countries and the occupation of their inhabitants were not the same at that remote period as they are now, and that meat and milk could have well been spared for the purpose for which they have been recommended. It must at the same time be remembered that unacquainted as the ancients would probably have been with the secrets of artificial manures, they did the next best thing, viz., they returned to the soil the product of the soil, whether primarily as sesamum seed, rice flour, barley, &c., or secondarily as the flesh of the goat, cow, pig and fish (the last-mentioned common enough in Ceylon as "fish-manure").

In reading the passages I have quoted, some allowance will of course have to be made for exaggeration,—a common enough failing among ancient writers,—as well as for a dash of superstition (I can call it by no other name) in claiming peculiar virtues for special parts or products of a plant or animal—instances of which are very common among old writers, and are even found associated with old nations yet extant.

There is no doubt that most of the recommendations are based on experience. The composts which are prescribed are evidently meant to supply all the ingredients of plant food, as far as anything was known of this subject. In the mixtures of seed mentioned as composts, care is taken to advise that seed should be first heated or put by for a sufficiently long period to destroy all germinating power; the seed of plants is happily chosen as the storehouse of the most valuable materials in the plant, while the selection of seeds for the mixture is by no means a bad one.

But here I must stop for the present, reserving for another issue of the Magazine a consideration of still more curious recommendations relative to agriculture.

SOILS AND MANURES.

Mr. Robert Tatlock, F. I. C., F. C. S., in a lecture on Soils and Manures, has been condemning in unqualified terms the analysis of soils as it is generally carried out by chemists. The composition of a soil, he says, does not necessarily throw any light on its value from an agricultural point of view, and no information short of a statement of the amount of valuable *available* material yielded by it during the period of, and under the conditions which obtain during growth, can be of service in this respect. Mr. Tatlock suggests a method for the examination

of a soil based upon the fulfilment of the conditions which occur in practice, as nearly as they can be attained. It is as follows:—

"Take a stout tin or zinc box of 2 cubic feet capacity, that is 24 inches deep and 12 inches diameter either way, and exactly half-way between the bottom and the open top insert a division or diaphragm of perforated zinc, which will act as a false bottom. Cut out in one block, neatly, a cubic foot of the soil, and slip it, surface uppermost, into the upper part of the box, its bottom resting on the perforated horizontal bottom of the box. Bury the latter, level with the ground, say, at the beginning of April, and let it remain till the end of September, when it will have received all the climatic influence of the surrounding soil during that period, including rain, which will percolate through it and collect in the bottom part of the box, carrying with it all the ingredients which have been dissolved. This solution is then analysed exhaustively. As 12 inches of rainfall will produce a cubic foot of liquid, there will probably not be sufficient room in the lower part of the box for the full amount, which may be double that or more, so that provision must be made for drawing it off from time to time, say, once a month. This can easily be done by having a piece of ordinary gas-pipe leading from near the extreme bottom of the box up through the diaphragm, and then through one of two perforations in an indiarubber cork, inserted airtight in a common 10-gallon glass carboy, the other perforation being fitted by another piece of piping, which, on being sucked, produces a partial vacuum, and so the fluid passes over from the box to the carboy where it is stored. For convenience, the body of the carboy may be partially buried in the ground. It will give me great pleasure to place such an apparatus for trial on any land, if one of the members will be good enough to give me facilities for so doing, and to analyse the product. The ingredients found should be calculated not only to per cent. of the soil, but to lbs. per acre, and compared with the amount of each of these removed from the same area of soil under favourable circumstances, by such crops as are intended to be grown. Of course, the full amount dissolved out will not be available for plant food, perhaps not one-half of it; but nevertheless, the results are a measure of the amount of the ingredients rendered soluble and assimilable, and consequently of the chemical value of a soil.

"Methods of analysis based upon the solubility of the essential ingredients in acids, more or less dilute, are arbitrary, and not to be trusted, as the conditions are totally different from those under which a soil gives up its useful constituents during plant growth."

And yet Mr. Tatlock considers,—and he thinks that every agriculturist and chemist, who has given his best attention to the subject will agree with him in this,—that no chemical analysis of a soil, however carefully carried out, and however exhaustive it may be, can be of the same value for practical purposes, as field experiments with various manures, systematically carried out by the farmer himself on his own land. This, he says, is simply a method of ascertaining what will suit a portion of actual soil in a particular locality, and consequently, what will suit the whole of it; and demonstrates what ingredients give the best results, in what propotions they should be employed, how they should be applied; whether together at the same time in a mixed state, or separately, and at different times; and finally, it will show the cost in practice. Another advantage claimed for this simple system is that it requires no knowledge of chemistry. Properly regulated experiments, or "trials" should be part of the work of every farmer, in which a well-arranged series of tests should be well thought out, committed to paper, and carried out, the weighing of the manures, the seeds, and the products or crops being accurately recorded in a book kept for the purpose.

The above remarks on the value of analyses of soils, coming as they do from a professional chemist, cannot be said to be made from any interested motives, and are well worthy of serious consideration, while too much value cannot be placed on the recommendation that each individual cultivator of the soil should carry on his own "trials" and carefully note their results.

GENERAL ITEMS.

Mr. L. P. Jayasuriya, Schoolmaster at Rupaha, in sending a specimen of stone, writes:—This stone found in Rupaha, Walapana, is known as Garundagala, and is of three varieties, viz., Nilgarunda, Kalugarunda, and Kirigarunda. The following is translated by Mr. H. S. Dias, of the School of Agriculture, from a communication to the *Lakrivikirana* newspaper, by Mr. Jayasuriya:—

"There is a stream in the village called Udapalata-Rupaha in Walapana which arises from a lake a little beyond Ragama, and flowing for about three miles eastward, falls into Rupas Oya near the village Rupaha. At a distance about 2½ miles from its source the stream flows by the rock known as Garundagala or Garundapasana. The natives claim healing properties for this stone, and Brahmins come all the way from India in search of it, making pilgrimages such as are made to Adam's Peak. The pilgrims generally stay a few days near the spot, and after having performed certain ceremonies, they carry away specimens of the stone as souvenirs. I have been assured by the natives that they have used the stone as a remedy, and found it efficacious in many diseases, and in part I can corroborate this statement from my own experience. It is said to cure the skin disease known as "itch," and is used as a remedy for snake-bite, and for stomache-ache, and for inducing secretion of milk in females after confinement, the stone being prepared for internal use by grinding some of it into a fine powder and mixing with lime juice. It is averred that those suffering from itch have been cured by bathing in the Nilgarunda Oya, and that abdominal pains have been cured by drinking OF ITS WATERS."

Mr. J. T. de Silva, late of the Agricultural School, writes:—Pasdun Korale, in the Western Province, contains a fairly large number of vil-

lages. The land which is generally hilly is of a fertile character, as is evidenced by the general appearance of vegetation. The inhabitants are nearly all engaged in Agricultural pursuits, and the district contains a large extent of paddy land, but the soil yields nothing like what it should under a proper system of cultivation; yet the produce the people get by the unsatisfactory methods which they adopt clearly proves the good quality of the land. The majority of the inhabitants supplement their income by wages received for working in plumbago mines and on tea estates. The plumbago industry is carried on to a large extent in the district, and though the workmen's wages are by no means high, yet, there are men found to undertake the unpleasant and tedious work required in plumbago mining. There are many Tea Estates in the Korale near the Kaluganga, and these supply a good deal of work to the people. But there is yet more land suited to paddy cultivation, waiting to be brought under the plough, and it will undoubtedly be a great boon to the inhabitants if an Agricultural Instructor be appointed to the district, so that they may become acquainted with the advantages to be derived by the use of new implements and the adoption of an improved system of cultivation.

In the last report of the Director of the Royal Botanical Gardens we read:—"The first flowering also of the coco-de-mer (Lodoicea Sechellarum) requires special notice. The tree is in its fortieth year, and examination of the immature flowers shows it to be a male. The inflorescence appeared at the end of June (1890), being put forth from the stem between the halves of the split base of one of the leaf-stalks. I regret to say it never got beyond the bud stage, some mischievous person having cut off the whole inflorescence soon after its appearance. We may, however, now expect the production of flowers each year."

Antiaris Toxicaria is the upas tree which yields *Upas antiar* a kind of green resin containing *Antiarin,* a poisonous principle. It is this resin which the Javenese use for poisoning their arrows. Curiously the exudation from the same tree grown in the Malay Peninsula is innocuous, as proved by examination of, and experiment with, a sample sent by His Excellency Sir Cecil Smith to Kew.

The earliest forms of Cinnamon occur in the Caniozoic or Tertiary period of geology. In the oligocene deposits found in Europe, the leaves of cinnamon occur in the clays and sandstones, and in some localities fossil specimens of the trees are associated with those of palms, the gum tree, acacias, custard-apple, lotus, camphor tree, and mimosa. Later on, cinnamon is found in the miocene deposits associated with the fig, vine, olive, ebony, and myrtle, thus proving the tropical character of the climate which prevailed over Western countries at that remote period.

The food of ants consists of insects, fruit, honey and honeydew. This last is a sweet liquid of a viscid description excreted by the aphides or plant-lice from a gland which is situated near the extremity of the abdomen, and communicates with the interior by two tubular filaments. The aphis is a curious little creature which blights our plants and trees, and though it is an enemy of ours it is a great friend of the ants, more especially young ants. It increases in numbers with wonderful rapidity by a process of parthenogenesis, and it will be noticed that wherever plant-lice abound ants are always present. The ant greedily devour the sweet excretion from the aphides, while they can also be observed to stroke and caress these plant-lice till the latter voluntarily exude the coveted liquid. In fact the ant "milks" the aphis, and the latter is therefore with reason called the ant's cow. It is even stated that ants keep aphides in their nests for milking purposes. It a common mistake among some to suppose that ants destroy plant-lice by feeding upon them. The aphides, which live upon the juices of plants, belong to the sub-order Homoptera, to which also belong the *Coccidæ* or scale insects and the *Fulgora* or fireflies.

Mr. Baumgartner, Assistant Government Agent of Matara, has left his station on furlough, much to the regret of the inhabitants of the Matara District. He has made himself conspicuous among Government officials by the interest he took in Agriculture and Horticulture, as well as in the welfare of the people generally. Before leaving, Mr. Baumgartner sent in a complete and excellent collection of specimens of the raw and manufactured products of his district for the Imperial Institute.

The following articles have been received for the School of Agriculture Museum:—Samples of fine grains grown in Kolonne Korale, Rakwana, from Mr. T. W. Goonewardene; an old porcelain plate, and a Kandyan lacquer plate, from Mr. T. B. Pohath Kehelpannala; specimens of Garundugalla from Walapana, from Mr. L. P. Jayasuriya and Mr. H. D. Lewis; a beautiful stalactitic specimen of caju tree gum, four feet four inches long, from Mr. J. P Ranasinghe.

We have to acknowledge copies of the Jaffna College Miscellany, and the number for March and April of the St. Thomas' College Magazine.

Mr. Manchanayake and Mr. Cooray, late of this School, having both got appointments under the Straits Settlement Government, have left Ceylon for Singapore.

Among the more notable Exhibits at the Grama Rakshaha Samagama Show held at Dalugama on the 27th April, were a young buffalo, 3 years old, covered with fine greyish hair, said to be cross between an Indian and Ceylon buffalo; some splendid coconuts of enormous size sent by Mr. Valerian Perera and Mr. John Ranasinghe; 3 uncommon-looking mangoes, of a reddish hue like those commonly met with in North India, exhibited by Mr. D. M. D. Alvis; and a bunch of gigantic plantains by Mr. Weerakoon,